PHOTOFACT* Folder

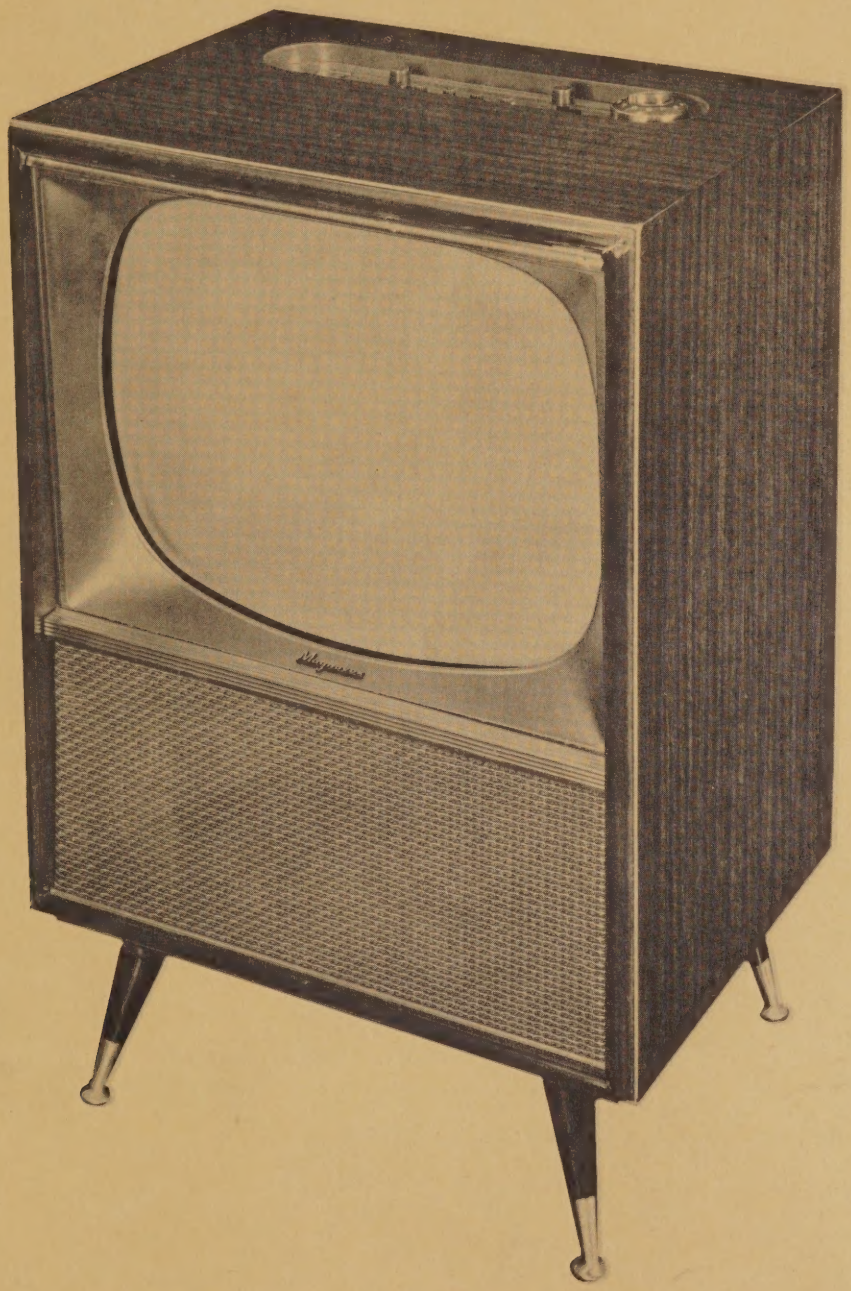
MAGNAVOX CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series)

MAGNAVOX CHASSIS U29-0100 thru
U29-0800, V29-0100 thru V29-0900 (29 Series)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MAGNAVOX CHASSIS U29-0100 thru
U29-0800, V29-0100 thru V29-0900 (29 Series)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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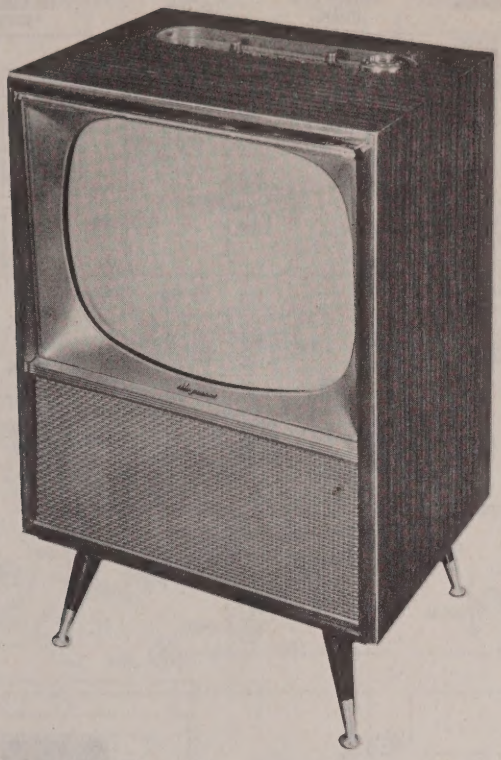
SET 447 FOLDER 2

MAGNAVOX CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series)



TRADE NAME	Magnavox	TV CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series), POWER TUNING UNIT 700769-2, REMOTE CONTROL UNIT 700742-1, CONTROL UNIT 700770-1
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana	
TYPE SET	Television Receiver with Phono Input	
TUBES	VHF-Nineteen, UHF-Twenty	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 185 Watts, 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

CHASSIS U/V29-0700 USE AMPLIFIER CHASSIS AMP-151CB. FOR SERVICE INFORMATION SEE PHOTOFACT SET 343 FOLDER 6 AND PRODUCTION CHANGE BULLETIN IN PHOTOFACT SET 398 FOLDER 5.

SERVICING IN THE FIELD

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)
One fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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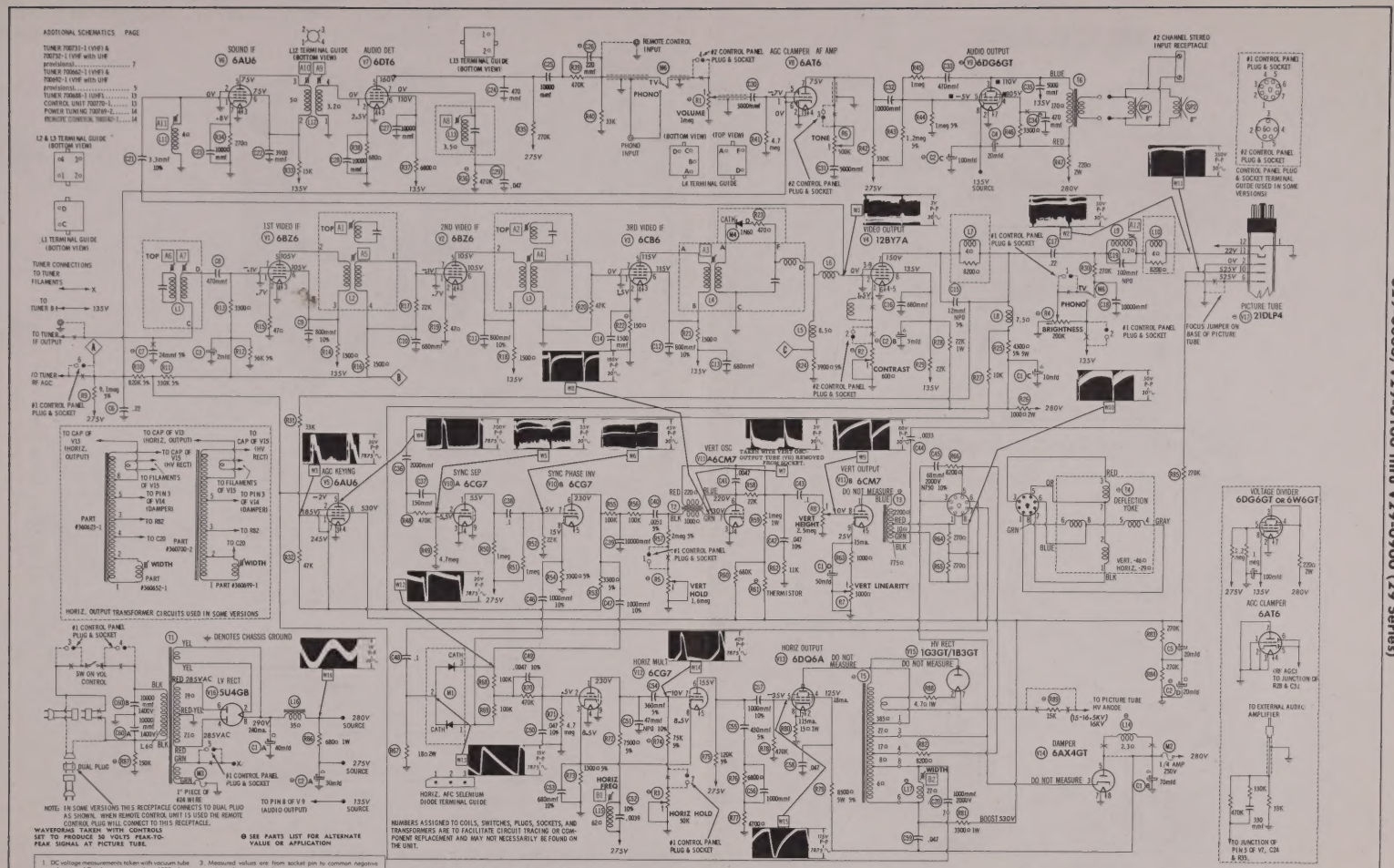
ADDITIONAL SCHEMATICS PAGE
TUNER 700731-1 (VHF) & 700732-1 (VHF with UHF provisions) 7
TUNER 700662-1 (VHF) & 700692-1 (VHF with UHF provisions) 5
TUNER 700688-1 (UHF) 13
CONTROL UNIT 700770-1 13
POWER TUNING 700769-2 13
REMOTE CONTROL 700582-1 14
SOUND IF V6 6AU6
AUDIO DET V7 6DT6
L2 & L3 TERMINAL GUIDE (BOTTOM VIEW)
L1 TERMINAL GUIDE (BOTTOM VIEW)
L4 TERMINAL GUIDE (TOP VIEW) (BOTTOM VIEW)
REMOTE CONTROL INPUT
#2 CONTROL PANEL PLUG & SOCKET
AGC CLAMPER AF AMP V9 6AT6
AUDIO OUTPUT V10 6DG6GT
#2 CHANNEL STEREO INPUT RECEPTACLE
#1 CONTROL PANEL PLUG & SOCKET
CONTROL PANEL PLUG & SOCKET TERMINAL GUIDE (USED IN SOME VERSIONS)
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V4 12BY7A
PICTURE TUBE V17 21DLP4
FOCUS JUMPER ON BASE OF PICTURE TUBE
TUNER CONNECTIONS TO TUNER FILAMENTS
TO TUNER B+ 135V
TO TUNER IF OUTPUT
TO TUNER RF AGC
CONTRAST 600K
BRIGHTNESS 200K
PHONO
AGC KEYING V5 6AU6
SYNC SEP V12A 6CG7
SYNC PHASE INV V12B 6CG7
VERT OSC V11A 6CM7
VERT OUTPUT V11B 6CM7 DO NOT MEASURE
VERT HEIGHT 2.5meg
VERT HOLD 1.6meg
VERT LINEARITY
THERMISTOR
DEFLECTION YOKE
VERT. -46.0 HORIZ. -29.0
HORIZ. OUTPUT TRANSFORMER CIRCUITS USED IN SOME VERSIONS
PART #360623-1
PART #360700-2
PART #360699-1
PART #360652-1
WIDTH
#1 CONTROL PANEL PLUG & SOCKET
DENOTES CHASSIS GROUND
3W ON VOL CONTROL
LV RECT 5U4GB
DUAL PLUG
1" PIECE OF #28 WIRE
TO PIN 8 OF V 9 (AUDIO OUTPUT)
135V SOURCE
280V SOURCE
275V SOURCE
HORIZ. MULT V13 6CG7
HORIZ OUTPUT V13 6DQ6A DO NOT MEASURE
HV RECT V15 1G3GT/1B3GT DO NOT MEASURE
TO PICTURE TUBE HV ANODE (15-16-5KV) 16KV
DAMPER V14 6AX4GT DO NOT MEASURE
1/4 AMP 250V
HORIZ. HOLD 50K
HORIZ. FREQ
WIDTH
BOOST 530V
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
VOLTAGE DIVIDER 6DG6GT OR 6W6GT
AGC CLAMPER 6AT6
(TO AGC) TO JUNCTION OF R28 & C31
TO EXTERNAL AUDIO AMPLIFIER
TO JUNCTION OF PINS OF V7, C24 & R35
NOTE: IN SOME VERSIONS THIS RECEPTACLE CONNECTS TO DUAL PLUG AS SHOWN. WHEN REMOTE CONTROL UNIT IS USED THE REMOTE CONTROL PLUG WILL CONNECT TO THIS RECEPTACLE.
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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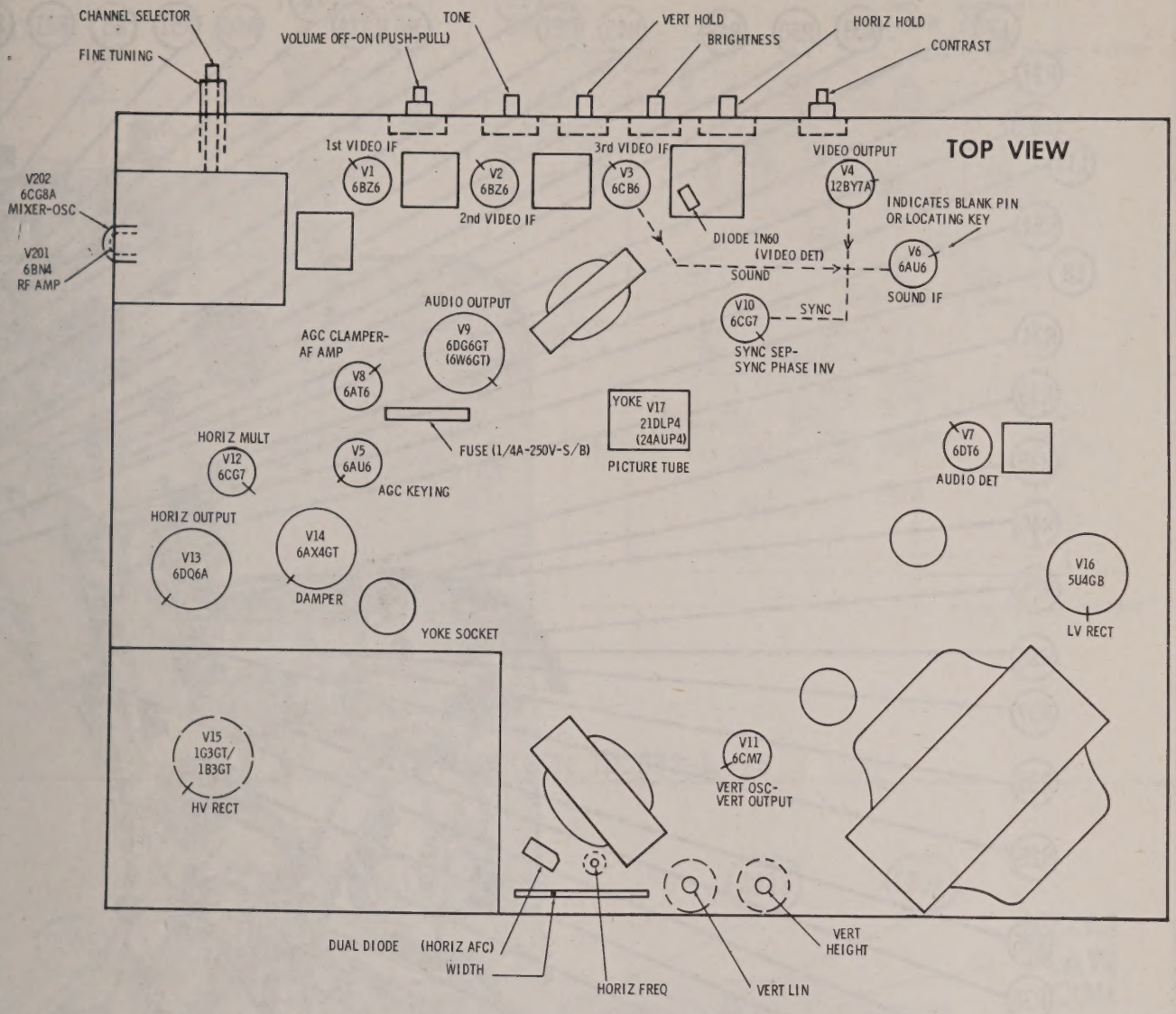
MAGNAVOX CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series)

TUBE PLACEMENT CHART



MAGNAVOX CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series)

TUBE FAILURE CHECK CHART

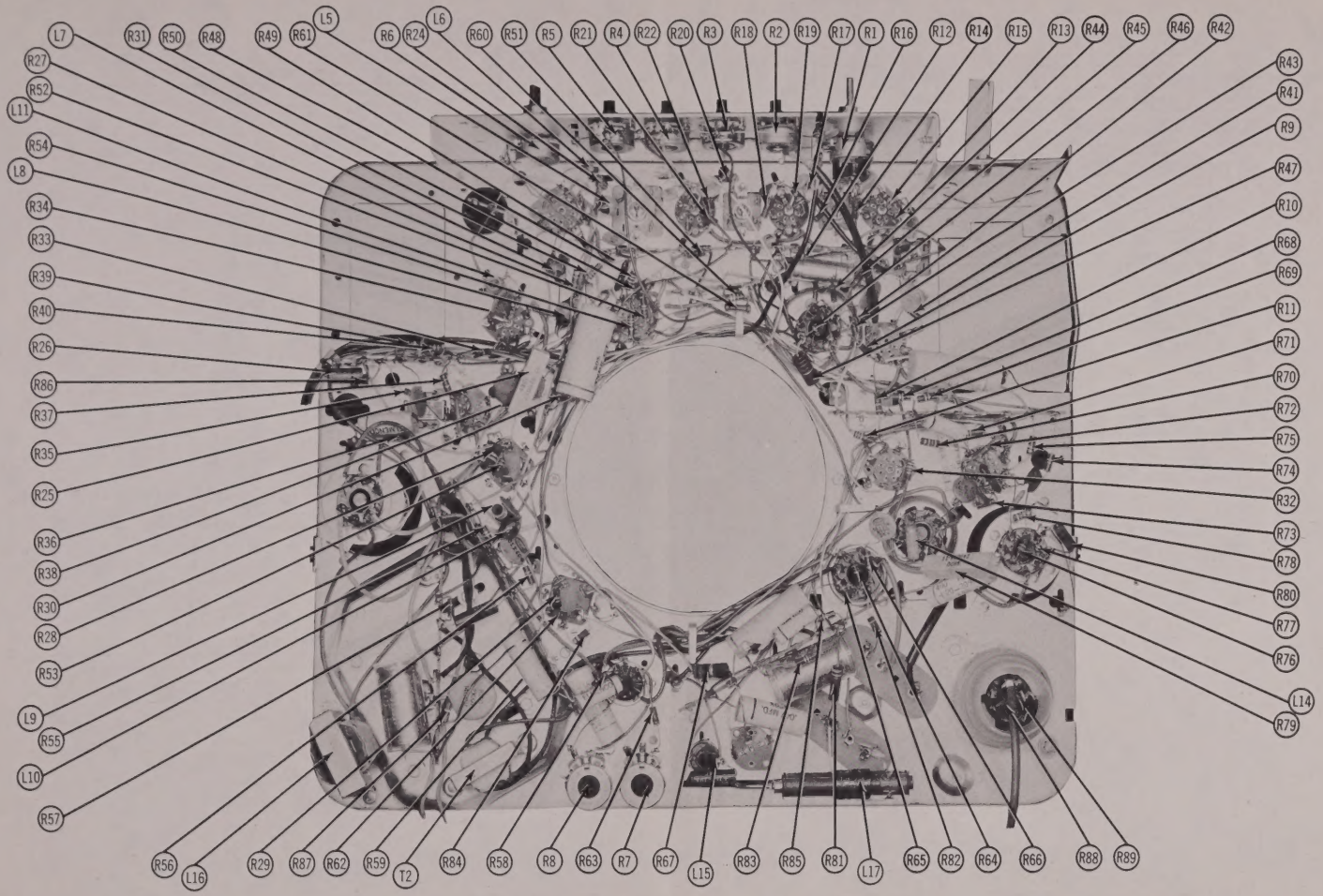
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wire (Fil.), V16

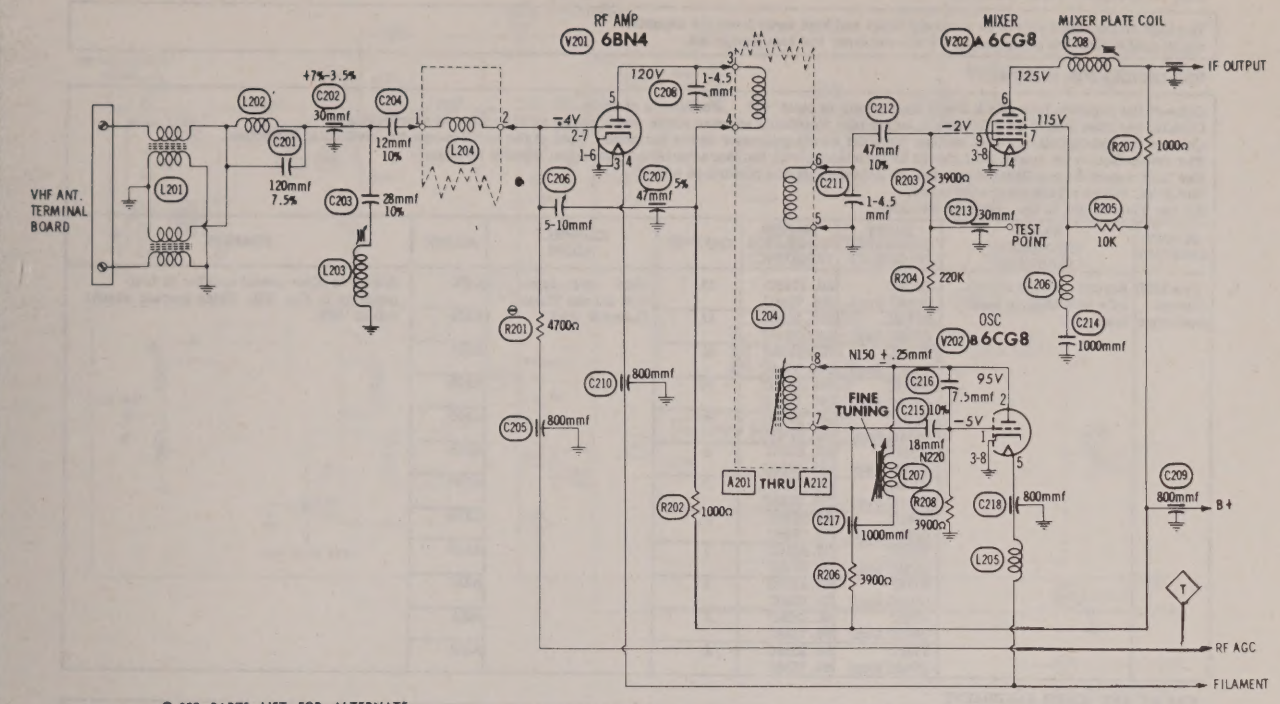
SWEEP FAILURE
No raster, has sound Rect. (Horiz. AFC), V12, V13, Fuse (1/4A), V14, V15, V17
No vertical deflection V11
Poor vert. linearity or foldover V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V11
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V9
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V6, V7, V8, V9
Overloaded picture V5

SYNC FAILURE
No vert. sync V10
No horiz. sync V10, Rect. (Horiz. AFC)
No vert. or horiz. sync V10



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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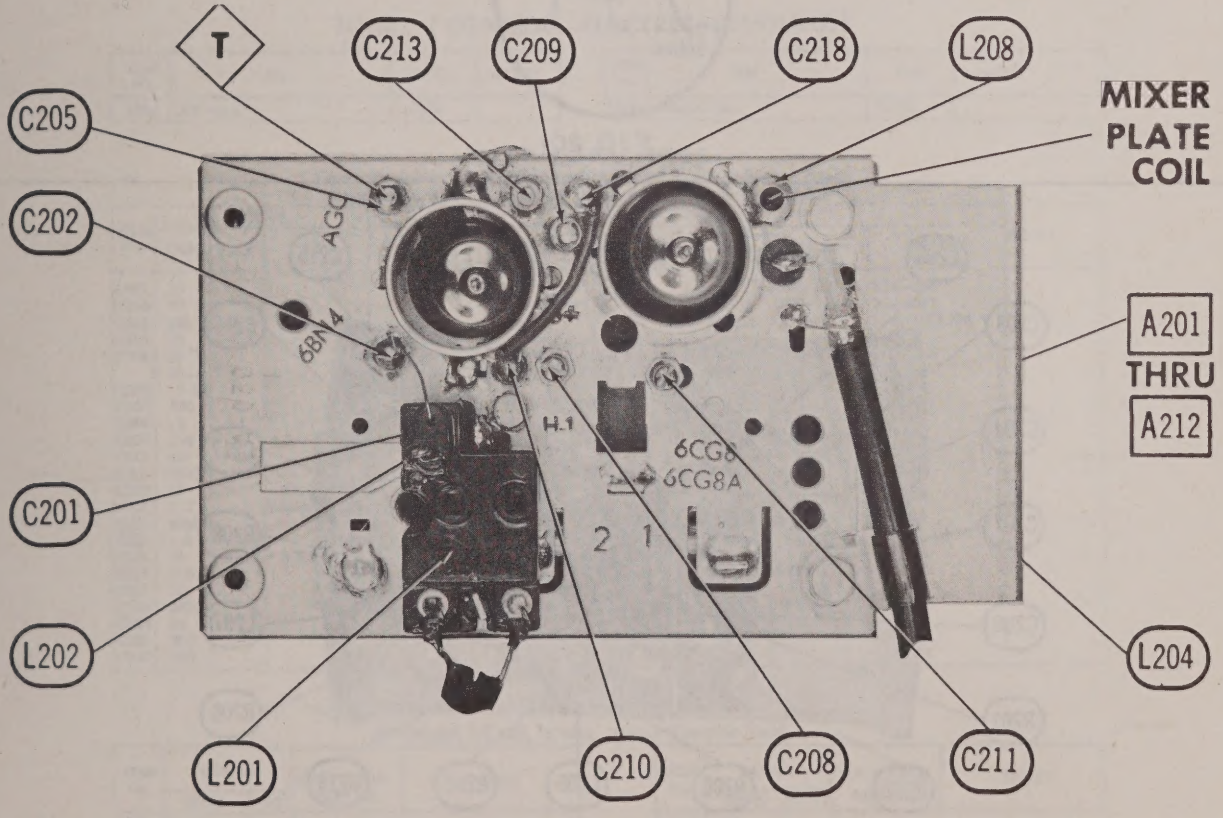
VHF TUNER 700662-1, -2



TUNER 700662-1 TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A202	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A203	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A204	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A205	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A206	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A207	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A208	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A209	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A210	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A211	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER

This protion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

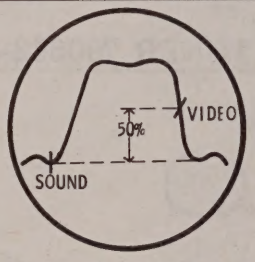
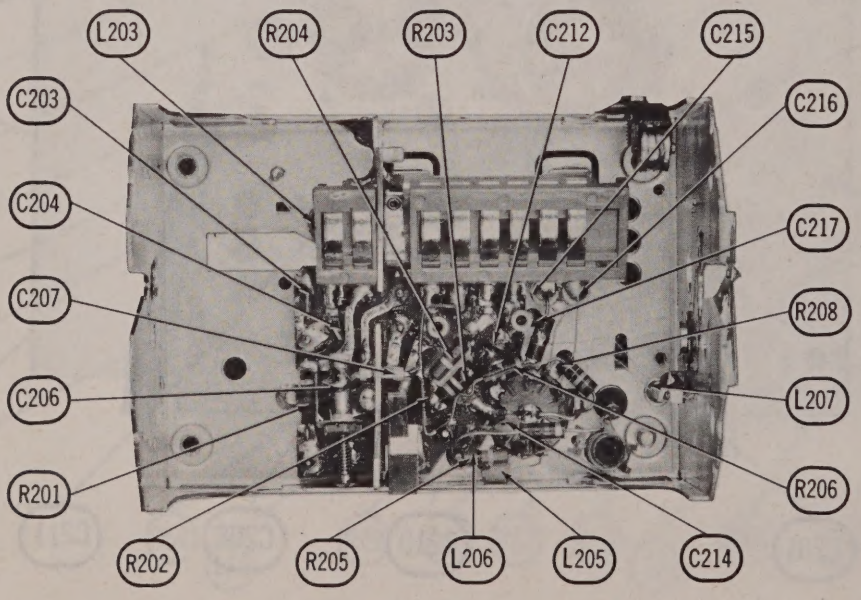
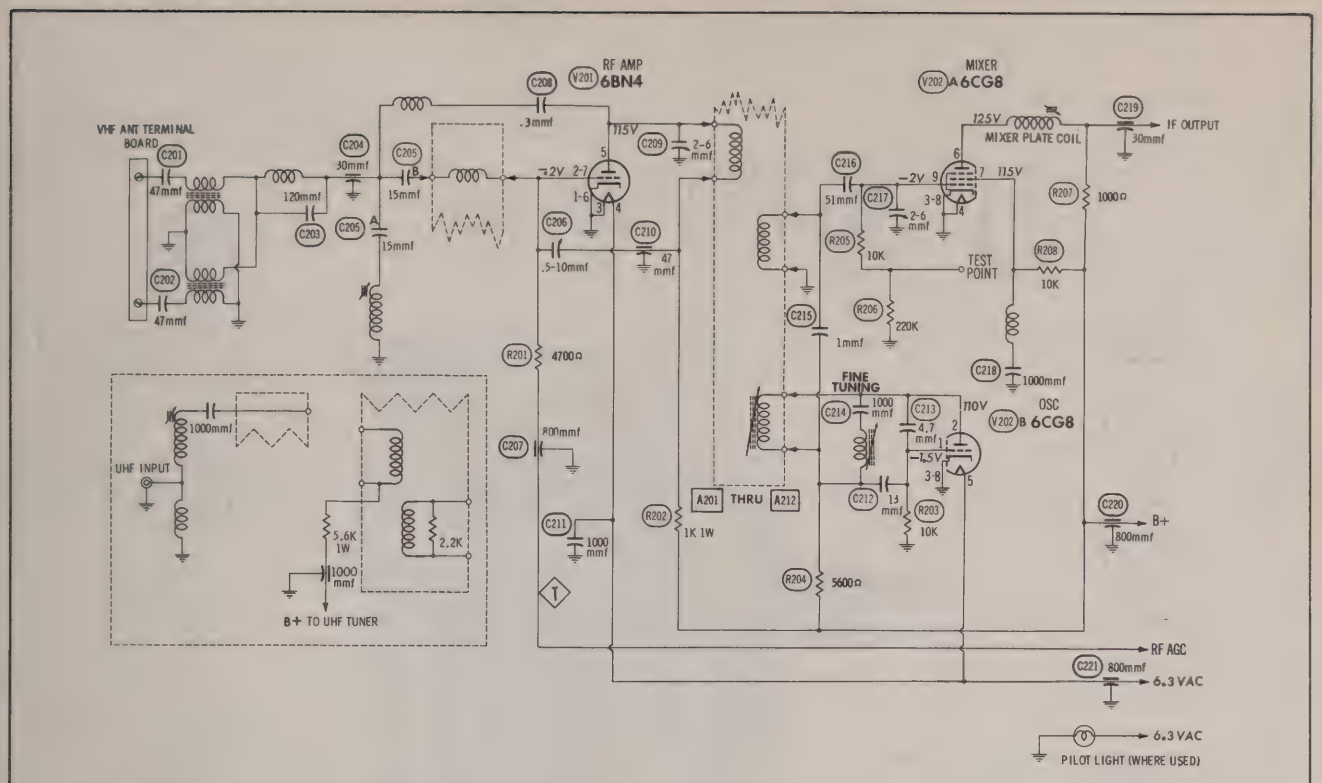


FIG. 201



TUNER 700662-1 BOTTOM VIEW



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TUNER 700731-1, 700732-1

TUNER PARTS LIST AND DESCRIPTIONS

700731-1

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

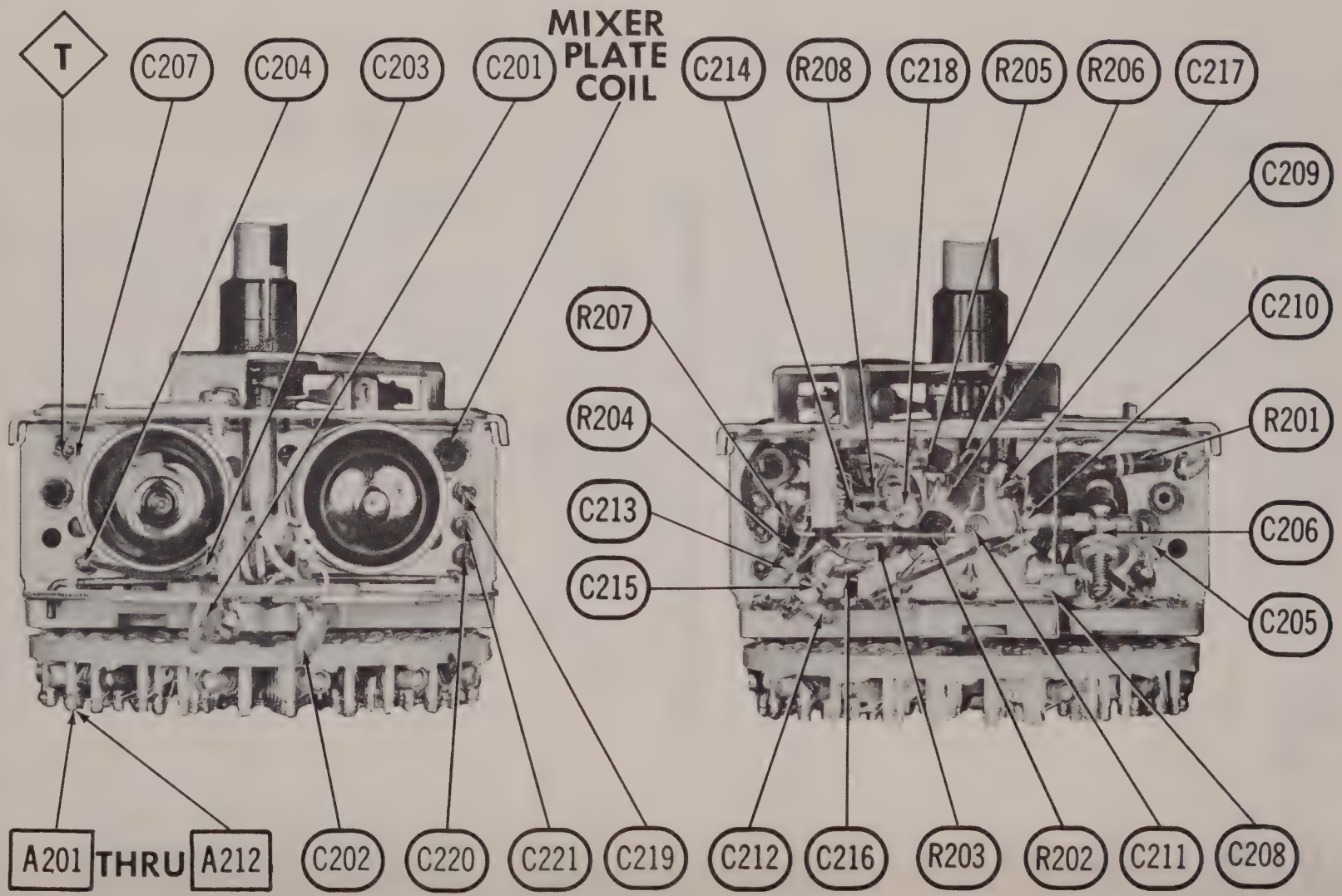
ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C202	47				BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C203	120		10%		DI-120	DD-121	L10T12	CNO-312	5GA-T12S 10% *	
C204	30									
C205A	15				BPD-000015	DD-150	L10Q15	CNO-415	5GA-Q15	
B	15				BPD-000015	DD-150	L10Q15	CNO-415	5GA-Q15	
C206	.5-10					829-10				
C207	800				EF-001	MFT-1000			503C-D1	
C208	.3									
C209	2-6					829-6		CT552		
C210	47				EF-00005	MFT-50				
C211	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C212	13		N220 5%							
C213	4.7		N220±.25mmf							
C214	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C215	1.0				NPO-SI 1	TCZ-1		CNO-510	5TCCB-V1	
C216	51		N750 10%		N750-SI 51	TCN-51	C10Q51U			
C217	2-6					829-6		CT552		
C218	30									
C219	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C220	30									
C221	800				EF-001	MFT-1000			503C-D1	
C222	800				EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			
R202	1000Ω	1		
R203	10K			
R204	5600Ω			

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R205	10K			
R206	220K			
R207	1000Ω			



TUNER 700731-1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

A1 thru A12 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519
Mixer Plate Coil..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Detune Mixer Plate Coil by turning core fully counterclockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 1st Video IF. Low side to chassis.	43.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis. (Across Video Det. load)	A1, A2	Adjust to place marker in trap notch as in Fig. 1. If two points are found to do this, use the one with the slugs farthest out of coils.
2.	"	"	"	42.25MC 45.0MC 45.75MC 47.25MC	"	"	A3, A4, A5	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust A3 for maximum gain, A4 to place 45.75MC marker at 50% on curve and A5 to place 42.25MC marker at 50% on other side. Recheck 47.25MC trap.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC	"	"	A6	Adjust to place 41.25MC marker in trap notch. If two points are found to do this, use the one with the slug farthest out.
4.	"	"	"	41.25MC 42.25MC 45.0MC 45.75MC	"	"	Mixer Plate Coil & A7	Adjust Mixer Plate Coil for maximum gain with 45.75MC marker at 50% as in Fig. 2. Adjust A7 for maximum gain and proper tilt. Repeat as necessary to obtain desired response. Recheck 41.25MC trap.

SOUND IF ALIGNMENT

Preset A8 for MINIMUM inductance.
Tune in a strong TV signal (preferably a tone signal or music). Adjust A8 just past the point of maximum sound with MINIMUM distortion.
Reduce the signal level by disconnecting the antenna leads or placing an adjustable attenuator pad across the terminals so that with the Volume set near maximum, sound is at a low level. Tune the Fine Tuning thru undistorted sound. Set the Fine Tuning at the verge of distortion.
Adjust A9, A10 and A11 for MINIMUM distortion.
Readjust the Fine Tuning as necessary during adjustment of A9, A10 and A11 to maintain the conditions described above.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Fine Tuning slowly clockwise until 4.5MC beat interference becomes visible in the picture.
Adjust A12 until the horizontal scanning lines are smooth and continuous.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

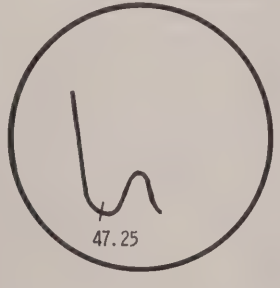


FIG.1

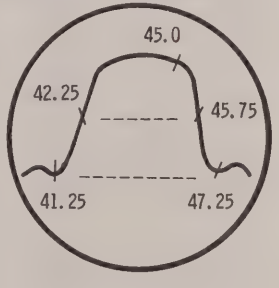


FIG.2

MAGNAVOX CHASSIS U29-0100 thru U29-0800, V29-0100 thru V29-0900 (29 Series)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp	6BZ6	
V3	3rd Video IF Amp	6CB6	
V4	Video Output	12BY7A	
V5	AGC Keying	6AU6	
V6	Sound IF Amp	6AU6	
V7	Audio Det.	6DT6	
V8	AGC Clamper-AF Amp.	6AT6	
V9	Audio Output	6DG6GT	6V6GT *

ITEM No	USE	TYPE	NOTES
V10	Sync Sep -Sync Phase Inv	6CG7	
V11	Vert Osc -Vert Output	6CM7	
V12	Horiz Multi	6CG7	
V13	Horiz Output	6DQ6A	
V14	Damper	6AX4GT	
V15	HV Rect.	1X2CT/ 8016	
V16	L/V Rect	1B3GT 5U4GB	

* Alternate

PICTURE TUBE

ITEM No	MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
	Rim Centered Gaffs				
V17	21CDP4		21CDP4 ①	21CDP4 ①	① "Silver Screen 66"
	21AUP4		21AUP4 ①		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	MAGNAVOX PART No.	ALLOYOXX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	≋40	350	27003I-52	D041T		FP430-15	TMQ-181	TVL-4631	
B	≋70	350							
C	≋10	350							
D	80	50							
C2A	≋30	350	27002I-84 ①	AFH4-56- 93 S	D041S	FP430-33	TMQ-182	TVL-4634.6	
B	≋8	350							
C	100	300							
D	≋30	150							
C3	2	50	27003T-23	SRE50V3	BSR3-50	TC302	TD-3-50	TVA-1301	
C4	30	350	27003T-20	PR3450V30	BR3035	TC85	TD-30-350	TVA-1608	
C5	30	150	27003T-20	PR3450V30	BR3035	TC85	TD-30-350	TVA-1608	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Alternate Part #27003I-85

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP	VOLT	TOL	MAGNAVOX PART No.	ALLOYOXX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	33	300	5%	25U301-15	P288N-33		CUB2P33	GEM-3033	STVL F33	
C7	94		5%	25U134-315	1469-000034	TCZ-34	22R5P34		HSC-S34	①
C5	470			25U18-4	BPD-00047	DD-471	BYAUD747	B-347	SGA-T47	
C9	800		10%	25U18-14				JL-383	SGA-T383 10% *	
C10	680		10%	25U18-10	BPD-00068	DD-681	BYAUD768	B-368	SGA-T68	
C11	800		10%	25U18-14				JL-383	SGA-T383 10% *	
C13	800		10%	25U18-14				JL-382	SGA-T382 10% *	
C15	680			25U18-10	BPD-00068	DD-681	BYAUD768	B-368	SGA-T68	
C14	1500			25U18-18	BPD-0015	DD-152	BYAUD215	B-215	5HK-D15	
C16	13		NPO 5%	25U175-400		DTZ-13	CUQ2G13	NPO-413	STCCB-Y13S 5%*	
C18	680			25U18-10	BPD-00068	DD-681	BYAUD768	B-368	SGA-T68	
C17	33	400		25U21-15	P488N-33		CUB4P33	GEM-4022	4TM-P33	
C20	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C19	100		NPO	25U175-59	NPO-DI 100	DTZ-100	CUQ1C	CNO-310	STCC-T1	
C21	1000	2000		25U175-27	HVD-N1000	DCH2-102	HVB1G	B-1G	HOA-D1	
C23	3 3		10%	25U21-12S	NPO-SI 3 3	TCZ-3R3	C10V33C	ZT-5S33	STCCB-V33	
C22	3900			25U175-31	BPD-0039	DD-392	L20D39	B-360	5GA-D39	
C23	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C24	470			25U18-6	BPD-00047	DD-471	BYAUD747	B-347	5GA-T47	
C25	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C26	330			25U18-38	BPD-00033	DD-331	L20T33	B-333	5GA-T33	①
C27	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C28	10000			25U18-19	BPD-01	DD-103	BYA30D	B-110	5HK-S1	
C29	047	300		25U21-7	P288N-047	DF-503	CUB3S47	GEM-4147	3TM-S47	
C30	470			25U175-30	BPD-006	DD-503	BYAUD6	B-250	5HK-D6	
C31	5000			25U175-30	BPD-006	DD-503	BYAUD6	B-250	5HK-D6	
C32	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C33	470			25U18-6	BPD-00047	DD-471	BYAUD747	B-347	5GA-T47	
C34	470			25U18-6	BPD-00047	DD-471	BYAUD747	B-347	5GA-T47	①
C35	5000			25U175-30	BPD-006	DD-503	BYAUD6	B-250	5HK-D6	
C36	2000			25U18-30	BPD-002	DD-202	BYAUD2	B-220	5HK-D2	
C37	1000			25U229-334	1469-00010	DD-102	22R5T15		HSC-S15	
C38	1	400		25U21-13	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C39	10000			25U18-19	BPD-01	DD-103	BYAUD8	B-110	5HK-S1	
C40	0082	600	5%	25U277-216					5TM-D8S2 5% *	
C41	0047	600	10%	25U21-4	P488N-0047	DH-472	CUB4D47	GEM-4247	4TM-D47	
C42	0047	600	10%	25U21-7	P562K047			GEM-4247	4TM-D47	
C43	1	400		25U21-13	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C44	0033	600		25U201-4	P488N-0033	DD-332	CUB4D33	GEM-4233	4TM-D33	
C45	68	3000	N750 10%	25U175-23						
C46	1000		10%	25U18-5	DI-1000		1R5DI	JL-210	5GA-D8 10% *	
C47	1000		10%	25U18-5	DI-1000		1R5DI	JL-210	5GA-D8 10% *	
C48	1	600	10%	25U290-2	V84C6P1			P36P1	GTM-601	6TM-P1
C49	047	600	10%	25U23-4	V84C4D47			P46D47	GTM-4247	4TM-D47
C50	047	300	10%	25U23-7	V84C2S47			P26S47	GTM-2147	2TM-S47
C51	47		NPO 10%	25U175-68	NPO-DI 47	DTZ-47		CUQ4C47	CNO-447	STCC-Q47S 10% *
C52	0039	300	10%	25U294-113					5BT-D39	
C53	680		10%	25U18-10	DI-680	DE-681	1R5T68	JL-368	5GA-T68S 10% *	
C54	360		5%	25U229-343	1469-00038		22R5T36		HSC-S36	
C55	430		5%	25U229-445	1469-00043		22R5T43		HSC-S43	
C56	1000		10%	25U175-65	BPD-001	DD-102	BYAUD1M	B-210	5HK-D2	
C57	1000		10%	25U218-8	DI-1000		1R5DI	JL-210	5GA-D8 10% *	
C58	047	400		25U21-7	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C59	047	600		25U290-1	V84C6S47			P46S47	GTM-6147	6TM-S47
C60A	10000	1400		25U19-3	DAC-27	DD-103	HVE10S	2HV-10	30HKB-S	
B	10000	1400			DAC-27	DD-103	HVE10S	2HV-10	30HKB-S	

① Not used in some versions.
② Ch. U/V29-07-00 use 330mmf in this application (Part #30053-28).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	
R1A	1meg	1	23013S-1				P216A	Volume, Note 1
B	Switch						Not Req.	Push-Pull Off-On
R2A	600Ω	1	23012S-71	B-415	A47-750-S	Q37-105	U3	Contrast, Note 1
B	Shaft			Not Req	FS-3	Not Req	Not Req.	
R3	50K		23014S-9	BX-51	B47-50K-S	Q31-133	PTA51.	Horiz. Hold, Note 3
R4	200K	1	23014S-10	BX-46	B47-200-K-S	Q31-129	U43	Brightness, Note 3
R5	1.5meg		23014S-11	BX-743	B47-1.5meg-S	Q31-138	PTA28L.	Vert. Hold, Note 2
R6	500K	1	23014S-12	B-80	B47-500K-Z	Q33-133	TA55A	Tone
R7A	3000Ω	1	23014S-8	AB-6	B47-3000-S	Q31-112	PTA1031L	Vert. Lin.
B	Switch			AK-19	Not Req.	Not Req.	Not Req.	
R8	2.5meg		23014S-2	BX-63	B47-2.5meg-S	Q31-239	TA255L	Vert. Height

Note 1. Ch. U/V29-03 use .5Meg Volume, 500Ω Contrast with switch (Part #230149-4).
Note 2. Ch. U/V29-03 use dual 1.5meg Vert. Hold, 50K Horiz Hold (Part #230149-3).
Note 3. Ch. U/V29-07 use 300K Brightness (Part #230128-72)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R9	9.1meg 5%		23044-254	
R10	680K 5%		230094-229	
R11	330K 5%		230094-219	
R12	56K 5%		230094-201	
R13	3300Ω		230144-58	
R14	1500Ω		230144-54	
R15	470		230104-46	
R16	1500Ω		230104-64	
R17	22K		230104-78	
R18	1500Ω		230104-64	
R19	47Ω		230104-58	
R20	47K		230104-82	
R21	1500Ω		230104-54	
R22	150Ω		230104-50	Note 1
R23	470Ω			
R24	39000 5%		230094-173	
R25	4300Ω 5%	5	260072-1	
R26	3900Ω	2	230096-43	
R27	10K		230104-74	
R28	22K	1	230105-78	
R29	22K		230104-78	
R30	270K		230104-81	
R31	33K		230104-90	
R32	47K		230104-82	
R33	15K		230104-73	
R34	270Ω		230104-55	
R35	270K		230104-81	
R36	470K		230104-94	Note 2
R37	68000		230104-72	
R38	5600		230104-60	
R39	470K		230104-94	
R40	33K		230104-80	
R41	4.7meg		230104-106	
R42	330K		230104-92	
R43	1.5meg 5%		230094-233	
R44	1meg 5%		230094-231	
R45	1meg		230104-98	
R46	3300Ω		230104-54	
R47	220Ω	2	230106-54	
R48	470K		230104-94	
R49	4.7meg		230104-106	

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R50	1meg		230104-98	
R51	1meg		230104-98	
R52	22K		230104-78	
R53	3300Ω 5%		230094-171	
R54	3300Ω 5%		230094-171	
R55	100K		230104-88	
R56	100K		230104-88	
R57	2meg 5%		230094-238	
R58	22K		230104-78	
R59	1meg	1	230105-98	
R60	680K		230104-96	
R61			230130-2	Note 3
R62	11K		230094-184	
R63	1000Ω		230104-52	
R64	270K		230104-55	
R65	270Ω		230104-55	
R66	8200Ω		230104-73	
R67	1MΩ	2	230104-44	
R68	100K		230104-88	
R69	100K		230104-88	
R70	470K		230104-94	
R71	4.7meg		230104-105	
R72	750K 5%		230094-180	
R73	1300Ω 5%		230094-183	
R74	75K 5%		230094-204	Note 4
R75	120K 5%		230094-209	
R76	5600Ω		230104-73	
R77	4700Ω		230104-70	
R78	470K		230104-94	
R79	82000 5%	5	260071-25	
R80	150	1	230105-40	
R81	3300Ω	1	230105-18	
R82	8200Ω		230104-73	
R83	270K		230104-81	
R84	270K		230104-81	
R85	270K		230104-81	
R86	680Ω	1	230105-60	
R87	150K			
R88	4.7Ω	1	230107-1	Note 5
R89	15Ω		230104-76	Note 6

Note 1. Some versions may use 130Ω in this application.
Note 2. Some versions may use 560K in this application (Part #230104-207).
Note 3. Temperature compensating, approximately 700K Cold.
Note 4. Some versions may use 100K 5% in this application (Part #230094-207).
Note 5. Some versions may use 18K in this application (Part #230107-1).
Note 6. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MAGNAVOX PART No.	Gramer PART No	Meissner PART No.	Merit PART No.	Miller PART No	Ram PART No	
L1A	1st Video IF	360864-1						
B	41.35MC Trap							
L2A	2nd Video IF	360644-1	17-5008 *	17-5003 *	TV-138 *	6333*		
B	47.85MC Trap							
L3A	3rd Video IF	360644-1	17-5008 *	17-5003 *	TV-138 *	6333 *		
B	47.85MC Trap							
L4	4th Video IF	360643-1						
L5	Shunt Peaking Coil	360832-16	19-3300	19-3300	TV-196	6130	VP-6	270uh
L6	RF IPF Coil	360443-23	19-1004	19-1004	BC-565	6610		8uh
L7	Series Peaking Coil	360832-14	19-3075 ▲	19-3075 ▲	TV-186 ▲	6172 ▲	VP-2 ▲	75uh †
L8	Shunt Peaking Coil	360832-9	19-3250	19-3250	TV-185	6115	VP-5	220uh
L9	6.5MC Trap	360714-1						
L10	Series Peaking Coil	360832-14	19-3075 ▲	19-3075 ▲	TV-186 ▲	6172 ▲	VP-2 ▲	75uh †
L11	1st Sound IF	360779-1		17-5402	TV-149 ▲	1470 ▲	SP-3	
L12	2nd Sound IF	360716-1			TV-149 *			
L13	Quadrature Coil	360716-2	17-1031 ■	17-1031 ■	TV-134 ■	1481 ■	SD-5	
L14	RF Choke	360691-8						3.3uh ② ①

* Use adapter plate.
▲ Parallel with 82000 resistor
■ Disregard tap.
◆ Enlarge mounting hole.
● Drill mounting holes.
† IRC Part #CLA.
† Wound on 82000 resistor.
① Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L15	63Ω		360579-2	HS-5	TV-163	6210	S-102	HS-5

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 ~ 1	MAGNAVOX PART No	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
L16	240A		35H 5 Hy	320058-4						

COILS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								
		MAGNAVOX PART No	Halldorson PART No	Merit PART No	Miller PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordorson PART No	Triad PART No.
L17	Width Coil (5-25MH)	360699	WC-19 ①	MWC-12 ①	6315 ①	20JR3A ①	QHC104 ①	WC-18 ①	WC-19 ①	WLC-3 ①
	Alt Width Coil (7-22MH)	360699-1	WC-19 ①	MWC-12 ①	6315 ①	20JR3A ①	QHC104 ①	WC-18 ①	WC-19 ①	WLC-3 ①
	Alt Width Coil (4-31MH)	360662-1 ②	WC-19 ①	MWC-12 ①	6315 ①	20JR3A ①	QHC104 ①	WC-18 ①	WC-19 ①	WLC-3 ①

① Drill new mounting hole. ② Used with 320623-1 Horiz. Output Transformer.

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA						
	PRI	SEC 1	SEC 2	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T1	117V ▲ 1.7A	570VCT ② 240A	6V ② 3A	300170-1	28R81				R-87BC ①	
	SEC 3 6.3V & 9.2A	SEC 4	SEC 5							

① Use original shields.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								
		MAGNAVOX PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Osc	320252-4	26A04	A-3003	V405	VBC19	A-8125	26A04	A-97X
T3	Vert Output	C320278-2							
	Alt Vert Output	320278-2							
T4	Yoke-Horiz. (21MH) (90°)-Vert (42MH)	360780-1	Y-16 ① ②	MDF-92 ③ ④ ⑤	Y20F19/43 ① ②	PCM2045 ① ②	DY-16A ① ③ ④	Y-16 ① ④	Y-41 ⑤ YC-1 & CL-1 ②
	Alt Yoke	700703-1							
	Rear Cover & Centering Device	360731-1							
T5	Horiz Output	360777-1	FLY-156 *					FLY-155 *	D-92 *
	Alt Horiz Output	360623-1	FLY-79 **	HVO-U9 **	X252 **	A-8295 **		FLY-79**	D-92**
	Alt. Horiz Output	360700-2	FLY-156 ***	HVO-U9 ***	X252 ***	A-8296 ***		FLY-156 ***	D-92 ***

① Requires new rear cover, centering device and yoke clamp. ② Remove Horizontal and Vertical Damping networks from yoke. ③ Remove Horizontal and Vertical Damping networks from yoke.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
	1	8				8	8
	3	5				5	5
	4	3				3	3
	8	2				2	4
Correct Width Coil Arrow	6	1				1	1
	5 & 6	2 & 1				2 & 1	4 & 1
Special Notes							④

④ Filament requires 2 turns.

* * HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
	8	8	8	8	8	8	8	8
	5	5	5	5		5	5	5
	3	3	3	3		3	3	4
	4	4	4	4		4	2	4
	2	2	2	2		2	2	2
Correct Width Coil Arrow	1	1	1	1		1	1	1
	2 & 1	2 & 1	2 & 1	2 & 1		2 & 1	2 & 1	2 & 1

PARTS LIST AND DESCRIPTIONS (Continued)

* * * HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	8	8	8		8	8	8
	5	5	5	5		5	5	5
	3	3	3	3		3	3	3
	2	2	2	2		2	2	2
	1	1	1	1		1	1	1
Connect Width Coil Across →	2 & 1	2 & 1	2 & 1	2 & 1		2 & 1	2 & 1	2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	3100Ω	3-4Ω	320279-1	26S50	A-3018	AU-600	A-3823	26S50	S-16X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	8"	PM	5-6Ω	583865	8A4Z5.6	
SP2	8"	PM	6-7Ω	583687	8A21Z6	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	MAGNAVOX PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		530045-3 ①	K1616 ①	IT1 ①②		① Selenium Type. ② Two used.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAGNAVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	.250A 125V S/B	180157-30		313.250 (3AG-1/4A-125V-S/B)	357001.	MDL 1/4	4405
M3	1" length of #24 Wire							

CRYSTAL DIODES

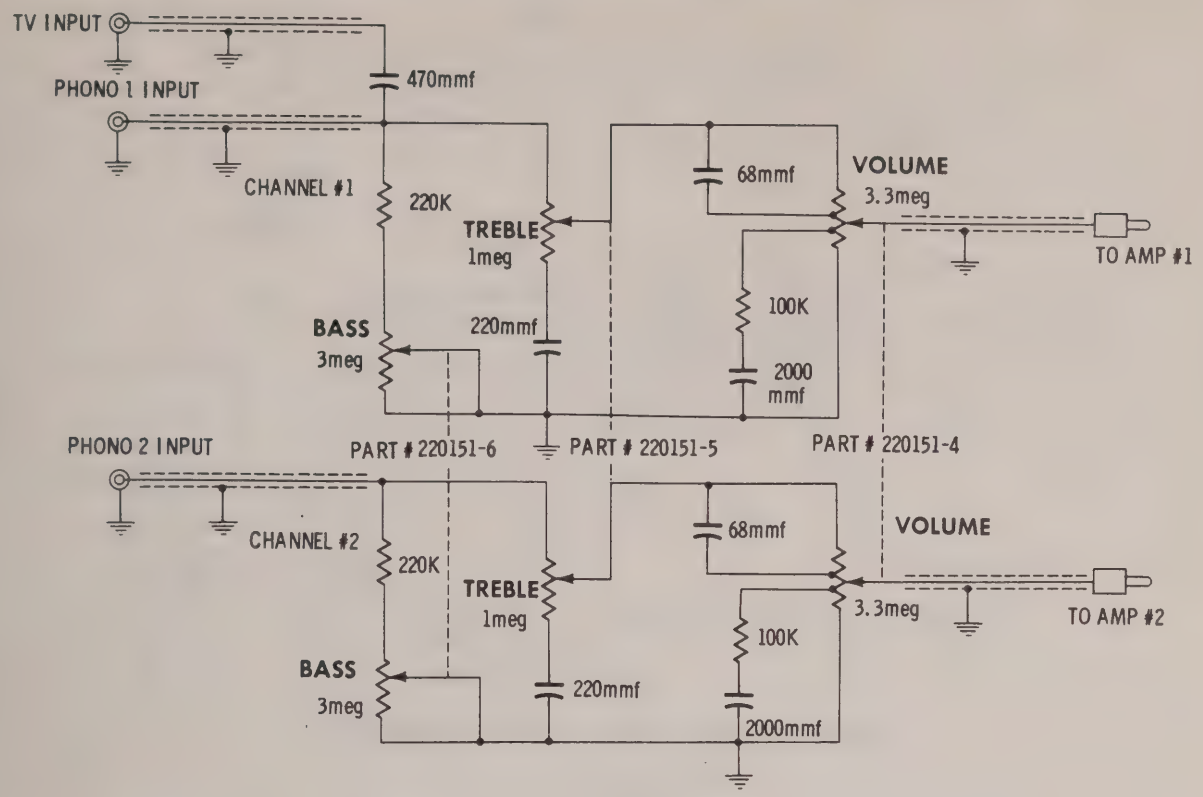
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N60 *		1N60	1N60	Video Det. (Pigtail) * Some versions may use 1N64 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M5	Tuner	700731-1	VHF Ch. V29-02-00 thru V29-08-00
	Tuner	700662-1	VHF Ch. V29-01-00, V29-09-00
	Tuner	700692-1	VHF with UHF provisions, Ch. U29-01-00
	Tuner	700732-1	VHF with UHF provisions, Ch. U29-02-00 thru U29-08-00
	Tuner	700688-1	UHF Ch. U29-01-00 thru U29-08-00
M6	Switch	160289-1	TV-Phono (Slide Type DPDT)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



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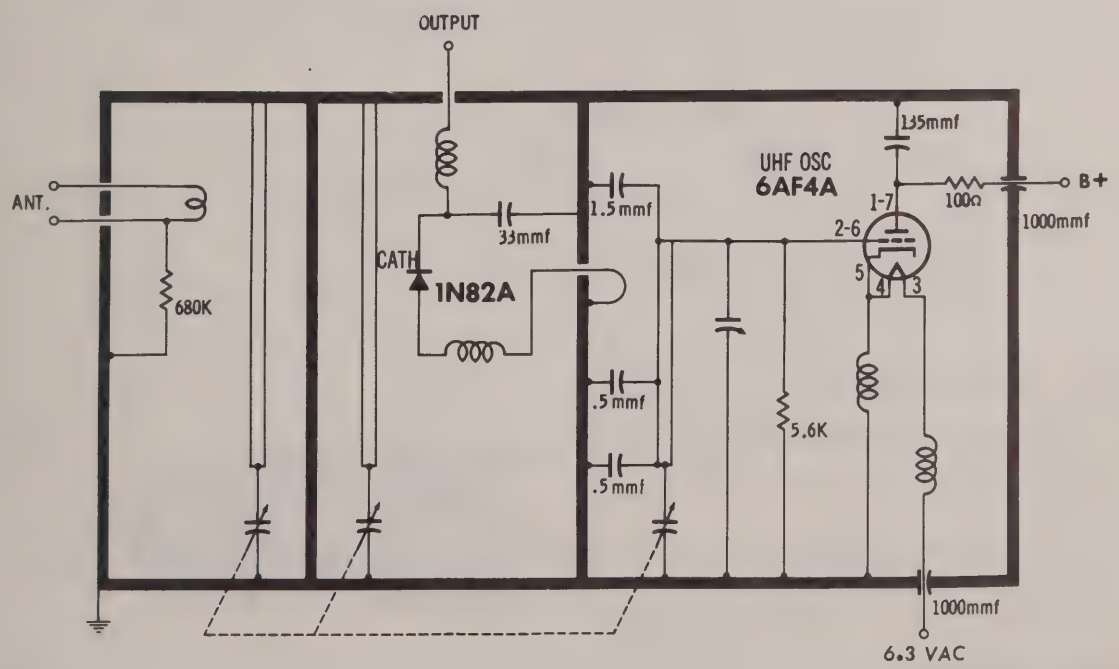
CONTROL UNIT 700770-1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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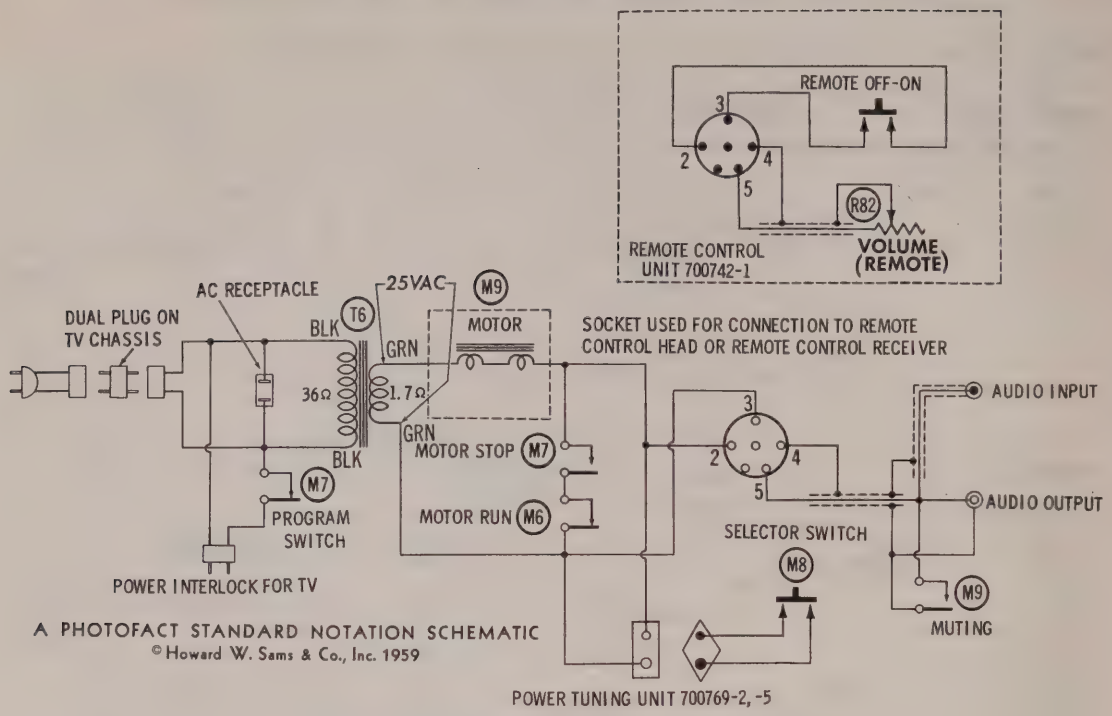
UHF TUNER 700688-1

POWER TUNING UNIT



PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R82A B	200K Switch	½	220152-1					Volume Channel Selector (Momentary)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T6	117V @ .57A	24V @ 2A		320286-2						

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M7	Switch	160295-1	Program Switch Assembly, Includes Motor Stop Switch and AC Off Switch
M8	Power Tuning Switch & Cable Assembly	700743	Includes Selector Switch & Cable Assembly
	Motor	500194-1	Includes Motor Run & Muting Switches

ADJUSTMENTS

1. To program channels for power and remote channel selector :
   a. Turn Channel Selector knob manually to set desired channel number to indicator line.
   b. Pull down on "Set" knob and release.
   c. Now when power button is pushed, the tuner will stop on the channel selected in step (1-a).

2. To program automatic power off position :
   a. Turn Channel Selector knob manually to the channel number (at indicator line) at which power off is desired.
   b. Turn "Set" knob to right and pull down to stop position.
   c. Now when tuner indexes at channel selected, the power to the TV will automatically shut off.

3. To clear a channel which is programmed :
   a. Set channel knob (1-a) above.
   b. Push up on "Clear" knob and release.
   c. Now the tuner will not stop on this channel.

TUNER PARTS LIST AND DESCRIPTIONS

700662-1, -2

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		250278						7.5%
C202	30		250279						+7%, -3.5%
C203	28		250280						10%
C204	12		250281						10%
C205	800		250282						
C206	5-10		260149						
C207	47		250283						5%
C208	1-4.5		260148						
C209	800		250282						
C210	800		250282						
C211	1-4.5		260148						
C212	47		250285						10%
C213	30		260284						
C214	1000		250289	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C215	18		250287						N220 10%
C216	7.5		250286						N150 ±.25mmf
C217	1000		250288	EF-001	MFT-1000			503C-D1	
C218	800		250282						

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			Note 1
R202	1000Ω		230104-60	
R203	3900Ω		230104-69	
R204	220K		230104-90	

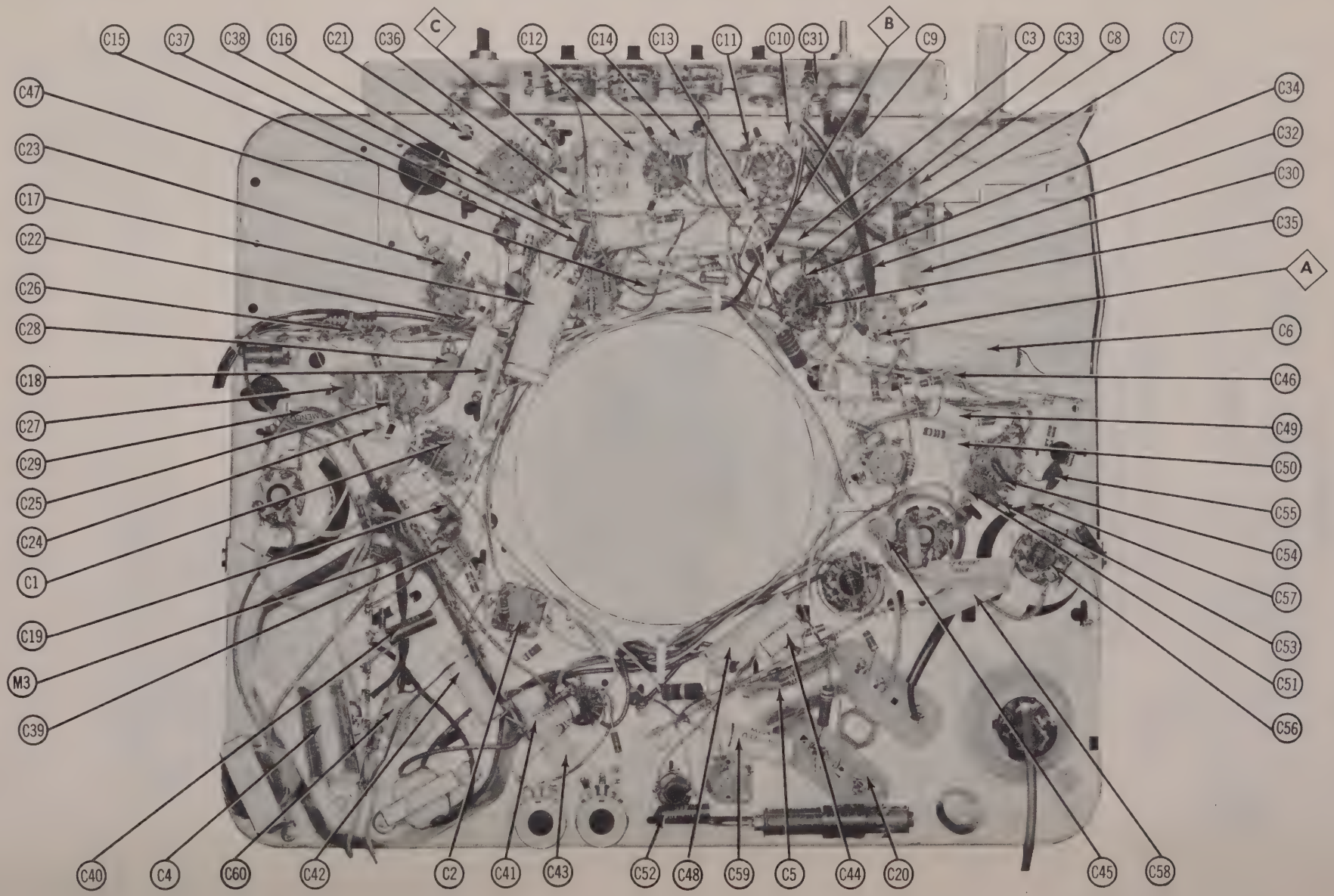
ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R205	10K		230104-74	
R206	3900Ω		230104-69	
R207	1000Ω		230104-62	
R208	3900Ω		230104-69	

Note 1. Some versions may use 47K in this application.

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L201	Ant. Trans. Assy.	360769	
L202	IF Trap Coil	360763	
L203	IF Trap Coil	360764	
L204A	Ant. RF, Mixer Grid, Osc. Coils	360761-2	Channel 2
B	"	360761-3	Channel 3
C	"	360761-4	Channel 4
D	"	360761-5	Channel 5
E	"	360761-6	Channel 6
F	"	360761-7	Channel 7
G	"	360761-8	Channel 8

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L204H	Ant., RF, Mixer Grid, Osc. Coils	360761-9	Channel 9
I	"	360761-10	Channel 10
J	"	360761-11	Channel 11
K	"	360761-12	Channel 12
L	"	360761-13	Channel 13
L205	Fil. Choke	360768	
L206	RF Choke	360766	
L207	Fine Tuning Coil	360767	
L208	Mixer Plate Coil	360765	



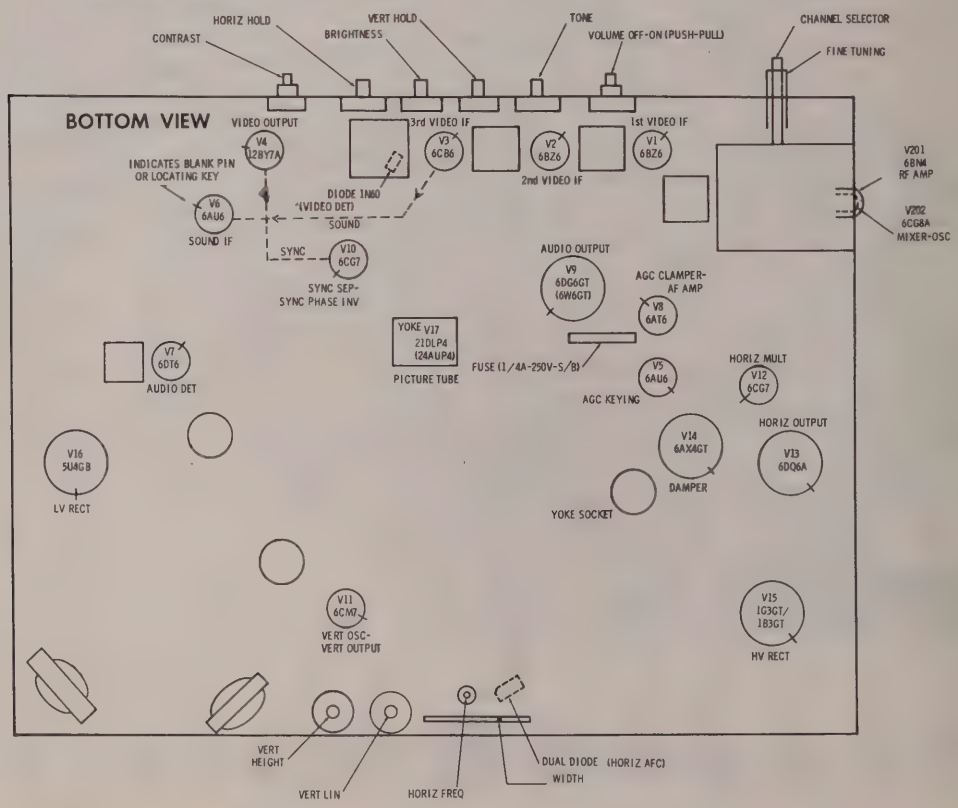
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

RESISTANCE MEASUREMENTS

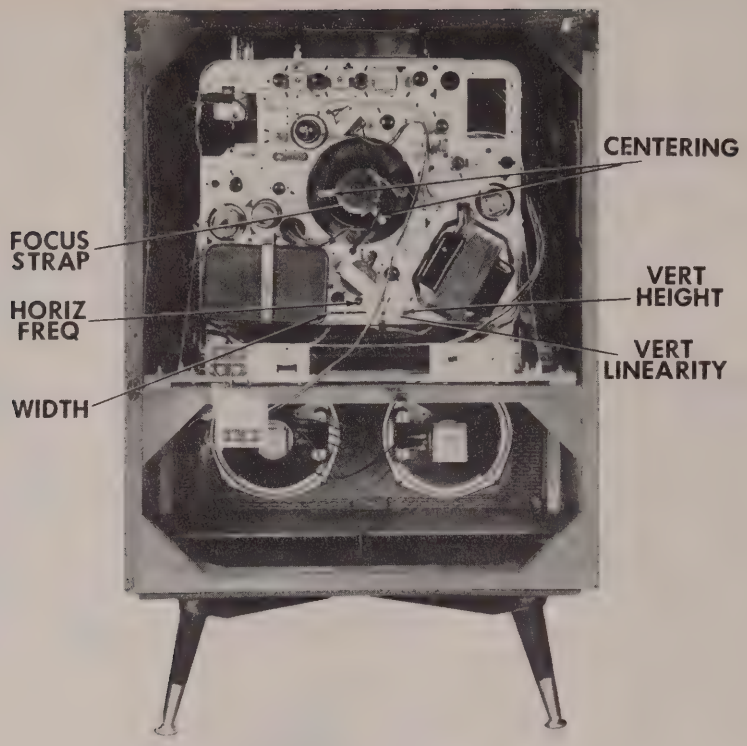
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	59K	47Ω	.1Ω	0Ω	††1500Ω	††1500Ω	0Ω		
V2	6BZ6	57K	47Ω	.1Ω	0Ω	††1500Ω	††1500Ω	0Ω		
V3	6CB6	.1Ω	150Ω	.1Ω	0Ω	††1500Ω	††1500Ω	0Ω		
V4	12BY7A	• 50Ω	3900Ω	0Ω	.1Ω	.1Ω	0Ω	†5300Ω	†23K	0Ω
V5	6AU6	†22K	†1000Ω	0Ω	.1Ω	390K	‡3300Ω	†1000Ω		
V6	6AU6	4Ω	0Ω	.1Ω	0Ω	††15K	††15K	270Ω		
V7	6DT6	3.2Ω	680Ω	.1Ω	0Ω	†270K	††6800Ω	560K		
V8	6AT6	4.7meg	0Ω	0Ω	.1Ω	1.1meg	1.1meg	†330K		
V9	6DG6GT	TP	0Ω	†390Ω	†3500Ω	500K	TP	.1Ω	¶	
V10	6CG7	†1meg	4.7meg	0Ω	0Ω	.1Ω	†4300Ω	22K	3300Ω	0Ω
V11	6CM7	‡5500Ω	NC	0Ω	0Ω	.1Ω	‡1.4meg	• 2.7meg	•1.6meg	• 2000Ω
V12	6CG7	†8100Ω	1.1meg	1300Ω	0Ω	.1Ω	†120K	•120K	1300Ω	0Ω
V13	6DQ6A	NC	.1Ω	TP	†8500Ω	470K	TP	0Ω	15Ω	TOP CAP ‡27Ω
V14	6AX4GT	TP	NC	¶1.5meg	NC	†2.3Ω	NC	0Ω	.1Ω	
V15	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡412Ω
V16	5U4GB	NC	¶	NC	21Ω	NC	19Ω	NC	¶	
V17	21DLP4	0Ω	0Ω	Pin 6 ‡270K	Pin 10 ‡270K	Pin 11 •320K	Pin 12 .1Ω			
V201	6BN4	0Ω	1.1meg	0Ω	.1Ω	††1000Ω	0Ω	1.1meg		
V202	6CG8A	10K	††5600Ω	0Ω	0Ω	.1Ω	††1000Ω	††10K	0Ω	230K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 280V SOURCE.
†† MEASURED FROM 135V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW

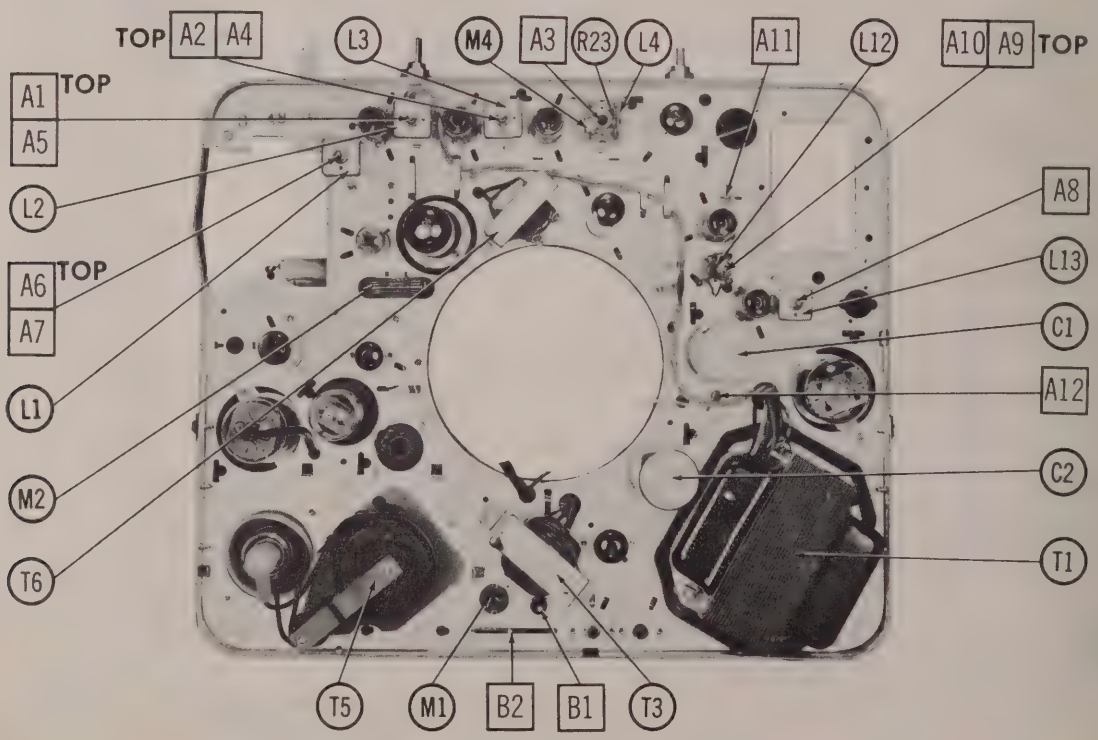
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station, preferably with a test pattern.

Set the Horizontal Hold control at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Check horizontal sync on other channels and if necessary, retouch B1 for best sync on all channels.

Adjust Width slug (B2) for picture slightly wider than necessary to fill the picture mask horizontally.



CABINET—REAR VIEW

The PHOTOFACT Servicer

SET 446 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JUNE 1959

CONTENTS PHOTOFACT SET 446

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
MAGNAVOX	
Chassis V30-01AA thru V30-12AA (30 Series)	446-1
WESTINGHOUSE	
H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)	446-2
PRODUCTION CHANGE BULLETIN	
ADMIRAL Television Rec.	
Chassis 16AF1, 16AH1, 16AX1, 16F1, 16H1, 16X1	446-3
MOTOROLA Television Rec.	
Y21K90CW, 21K90CW (Ch. TS-544, Y)	446-3
PACKARD-BELL Television Rec.	
21SC6, 21SC7, 21SC8, 21SC9, 21SC11, 21SC12, 21SK3, A, 21ST3, 21ST4, 21VT2, 21VT3, 24SC2, 24SC3, 24ST4, 24VT1 (Ch. 88S3, 88S4)	446-3
OTHER EQUIPMENT	
ADMIRAL	
4L21, 24, 25, 26, 28, 4M22, 23, 25, 28, 251 (Ch. 4L2, 4M2)	446-4
581, 582 (Ch. 5W4)	446-5
CROWN Tape Recorder	
Imperial	446-6
FISHER	
X-101	446-7
FORD	
94BF (B9A-18805-A, B9AF-18806-D)	446-8
GELOSO	
G-307	446-9
GENERAL ELECTRIC	
C440A, C441A	446-10
HITACHI	
TH-666	446-11
INTERNATIONAL	
94MIM	446-12
MAGNAVOX	
Chassis 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11	446-13
MOTOROLA	
6K13B, CW, M, W (Ch. HS-675)	446-14
RIVERSIDE	
FJB-6679A	446-15
WESTINGHOUSE	
H-48SE1, 2, 3, 4, 5 (Ch. V-2503-5)	446-16

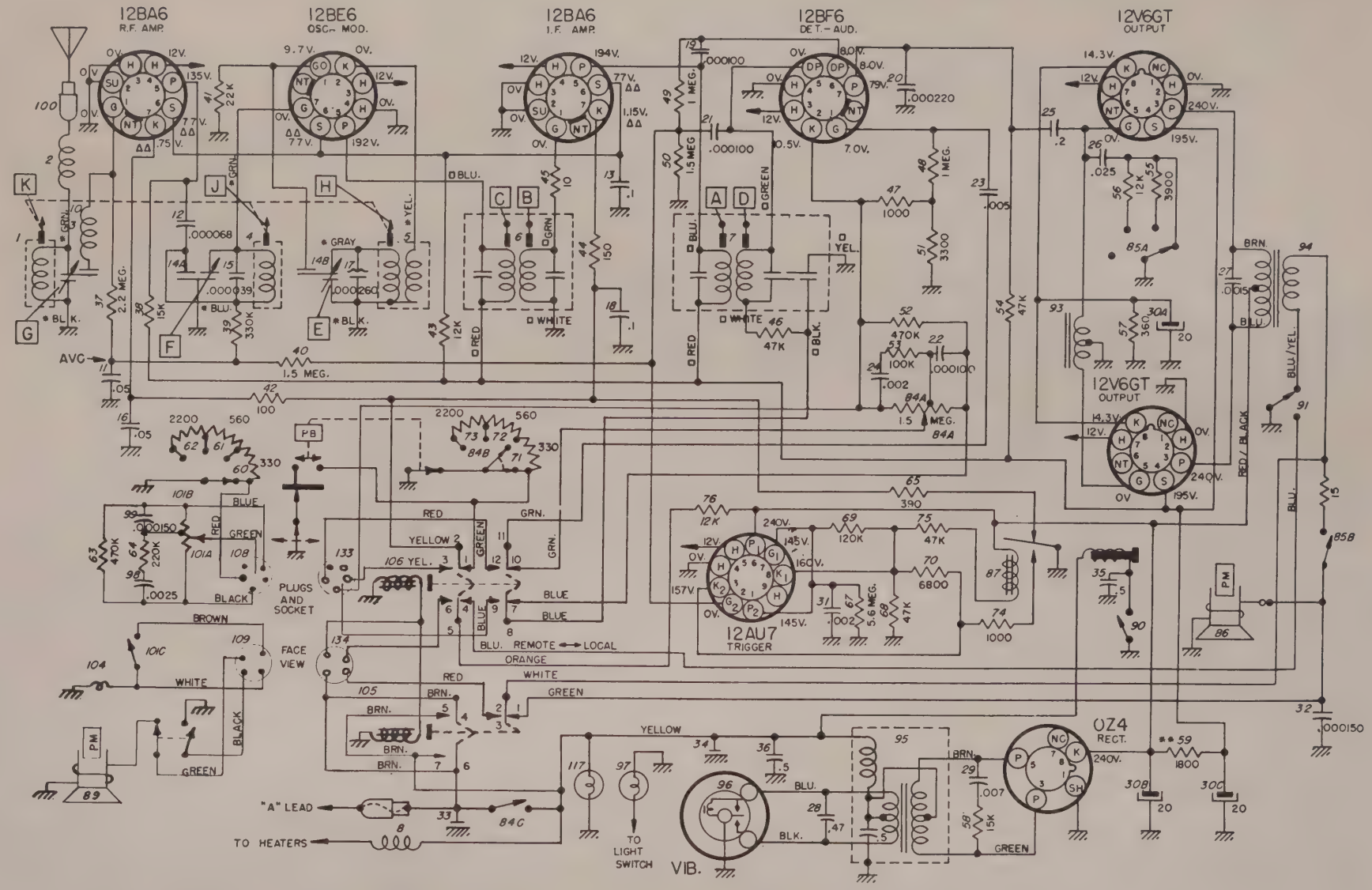
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Cadillac
Model 7265855

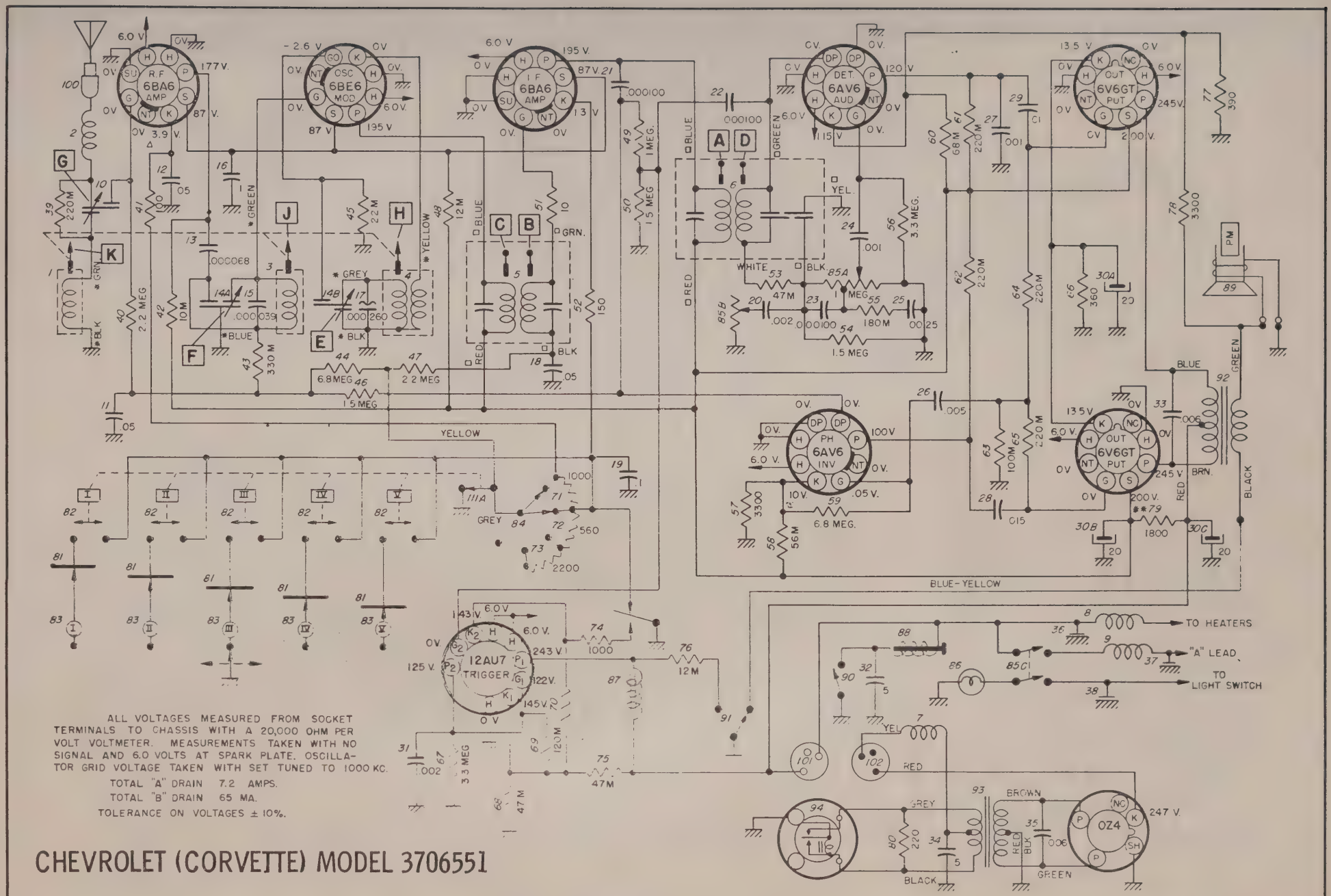
Chevrolet (Corvette)
Model 3706551

David Bogen
Model RB140



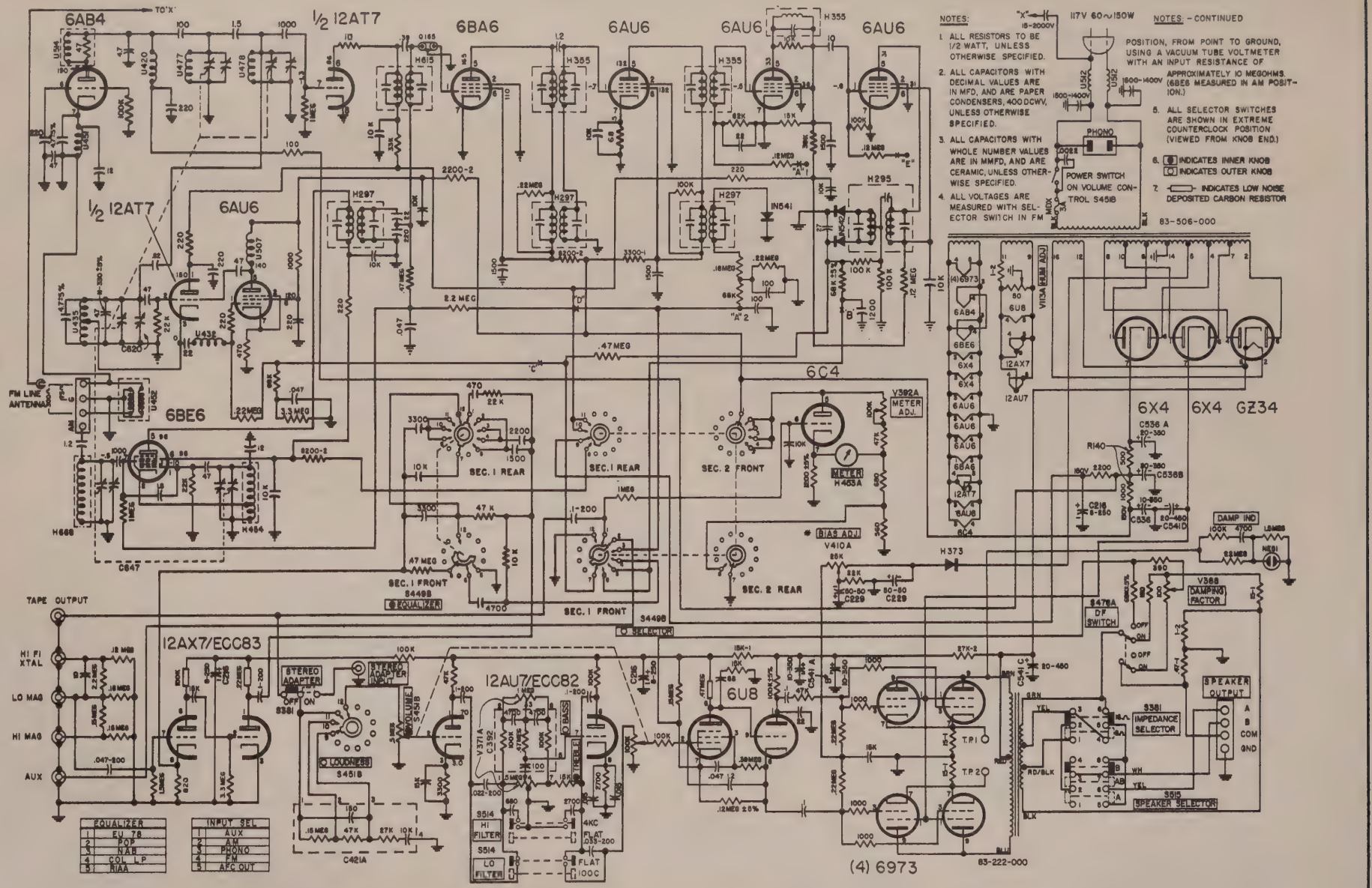
CADILLAC MODEL 7265855

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.


R.F 6BA6 AMP
OSC 6BE6 MOD
I F 6BA6 AMP
DET. 6AV6 AUD
OUT 6V6GT PUT
PH 6AV6 INV
OUT 6V6GT PUT
12AU7 TRIGGER
0Z4
PM
TO HEATERS
"A" LEAD
TO LIGHT SWITCH
YELLOW
BLUE-YELLOW
ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.
TOTAL "A" DRAIN 7.2 AMPS.
TOTAL "B" DRAIN 65 MA.
TOLERANCE ON VOLTAGES ± 10%.

CHEVROLET (CORVETTE) MODEL 3706551

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.



DAVID BOGEN MODEL RB 140

Schematic Diagram Courtesy of David Bogen Co.

EIA PRODUCTION SOURCE CODE - 1959

Code symbols assigned to radio-television manufacturers and suppliers, arranged both alphabetically by companies and numerically by code numbers.

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ELECTRONIC INDUSTRIES ASSOCIATION
1721 De Sales Street, N. W. Washington, 6 D.C.

HOWARD W. SAMS & CO., INC.
Indianapolis 5, Indiana

ALPHABETICAL LIST

(* Indicates non-members)

Company	Code No.
ACF Electronics, Division of ACF Industries, Inc., Alexandria, Va.	900
*Acme Coil & Transformer Corp., Chicago 14, Ill.	928
*Acme Electric Corporation, Cuba, N. Y.	413
Acro Products Company, Philadelphia 28, Penna.	878
Adler Electronics, Inc., New Rochelle, N. Y.	813
*Admiral Corporation, Chicago 47, Ill.	101
*Advanced Research Associates, Inc., Kensington, Md.	1062
*Aerolite Electronics Corp., Union City, N. J.	910
Aerovox Corporation, New Bedford, Mass.	102
*Ajax Condenser Co., Inc., Chicago 14, Ill.	705
Aladdin Electronics, a Division of Aladdin Industries, Inc., Nashville 10, Tenn.	689
*A.L.A. Industries, Inc., Harrison, N. Y.	1031
Alcon Metal Products, Inc., Chicago 47, Ill.	573
Allen-Bradley Company, Milwaukee 4, Wis.	106
The Alliance Manufacturing Co., Inc., Alliance, Ohio	107
All Star Products, Inc., Defiance, Ohio	110
Alpha Metals, Inc., Jersey City 4, N. J.	733
Altec Lansing Corporation, Anaheim, Calif.	391
American Electronics Company, New York 59, N. Y.	978
*American Lava Corporation, Chattanooga 5, Tenn.	681
*American Radionic Co., Inc., Danbury, Conn.	648
American Television & Radio Co., St. Paul 1, Minn.	551
*American Transformer Corp., Chicago 7, Ill.	892
Amperex Electronic Corporation, Hicksville, L. I., N. Y.	111
Amphenol Electronics Corporation, Chicago 50, Ill.	554
*The Amplifone Corporation, Chicago 40, Ill.	1002
*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.	547
*Andrea Radio Corporation, Long Island City 1, N. Y.	113
Andrew Corporation, Chicago 19, Ill.	402
*Andrews Tower Rental, Inc., Fort Worth, Tex.	852
The Antenna Specialists Company, Cleveland 6, Ohio	920
Anton Electronics Laboratories, Inc., Sub. of U. S. Hoffman Machinery Corp., Brooklyn 37, N. Y.	961
*Apex Coil & Transformer Corp., Chicago 8, Ill.	949
A. R. F. Products, Inc., River Forest, Ill.	115
Armel Electronics, Inc., Brooklyn 32, N. Y.	893
The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.	116
Arvin Industries, Inc., Columbus, Ind.	248
*Associated Transformer Corp., Chicago 47, Ill.	1035
Atlantic Wire & Cable Corp., College Point 56, N. Y.	792
Audio Devices, Inc., Rectifier Division, Santa Ana, Calif.	1051
Automatic Manufacturing Division, General Instrument Corp., Newark 4, N. J.	119
Automatic Radio Mfg. Co., Inc., Boston 15, Mass.	120
Barker & Williamson, Inc., Bristol, Penna.	461
Barnes Metal Products Company, Chicago 23, Ill.	588
*Bartlett Manufacturing Company, Glenview, Ill.	985
Basler Electric Company, Highland, Ill.	695
The Bead Chain Manufacturing Co., Bridgeport 5, Conn.	122
Belden Manufacturing Company, Chicago 44, Ill.	579
Bendix Radio, Division of Bendix Aviation Corp., Baltimore 4, Md.	125
*Best Manufacturing Co., Inc., Irvington 11, N. J.	371
*Better Coil & Transformer Corp., Goodland, Ind.	831
*Blackburn Electronic Corporation, Wyoming, Pa.	912
Bliley Electric Company, Erie, Pa.	128
David Bogen Co. Division, The Siegler Corp., Paramus, N. J.	589
Bomac Laboratories Inc., Beverly, Mass.	940
*Bradford Components, Inc., Salamanca, N. Y.	1044
*Bradley Semiconductor Corporation, New Haven 11, Conn.	812
British Industries Corporation, Port Washington, L. I., N. Y.	409
Brubaker Electronics, Inc., Culver City, Calif.	817
*Burnell & Co., Inc., Pelham Manor, N. Y.	1014
*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.	1071
Caledonia Electronics & Transformer Corp., Caledonia, N. Y.	503
*California Magnetic Control Corp., North Hollywood, Calif.	799
Callins Industries, Inc., Greenfield, Tenn.	1068
Cal-Ros Industries, Inc., Chicago 22, Ill.	1039
Calvideo Tube Corporation, Los Angeles 45, Calif.	886
Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.	1017
C. F. Cannon Co., Springwater, N. Y.	133
*Carbonneau Industries, Grand Rapids 2, Mich.	719
*Cargo Packers, Inc., Glendale 27, N. Y.	901
*Carol Electronics Corporation, Martinsburg, W. Va.	837
Carter Parts Company, Skokie, Ill.	610
C-B-C Electronics Co., Inc., Philadelphia 20, Pa.	867
CBS-Hytron, Division of Columbia Broadcasting System Inc., Danvers, Mass.	210
Celco (Constantine Engineering Labs. Co.), Mahwah, N. J.	692
Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.	134
*Central Coil Company, Indianapolis 22, Ind.	637
Central Electronic Manufacturers, Inc., Denville, N. J.	841
*Channel Master Corporation, Ellenville, N. Y.	1059
Chemtronic Corporation, Nashville 4, Tenn.	1064
*Chester Cable Corp., Chester, N. Y.	909
Chicago Condenser Corporation, Chicago 47, Ill.	135
*Chicago Electronic Engineering Co., Chicago 47, Ill.	166
*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.	138
Chicago Telephone Supply Corp., Elkhart, Ind.	137
*Cinaudagraph Inc., Chicago 26, Ill.	145
Cinch Manufacturing Corporation, Chicago 24, Ill.	139
Clarostat Mfg. Co., Inc., Dover, N. H.	140
*Cleveland Electronics, Inc., Cleveland 3, Ohio	433
Clevite Transistor Products, Waltham 54, Mass.	856
*Clippard Instrument Laboratory, Inc., Cincinnati 34, Ohio	530
*Coilcraft, Incorporated, Cary, Ill.	906
*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.	141
Collins Radio Company, Cedar Rapids, Ia.	439
*Columbia Technical Corporation, Woodside 77, N. Y.	1048
*Columbus Process Co., Inc., Columbus, Ind.	450
Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.	1019
*Communication Measurements Laboratory, Inc., Plainfield, N. J.	427

Company	Code No.
Connector Corporation, Chicago 30, Ill.	838
Conrac Incorporated, Glendora, Calif.	680
Consolidated Wire & Associated Companies, Chicago 16, Ill.	607
Continental Carbon, Div. of Wirt Company, Philadelphia 44, Pa.	146
Continental Electric Company, Chicago 2, Ill.	147
Continental Electronics Corp., Philadelphia 32, Penna.	811
*Controls Company of America, Schiller Park, Ill.	711
Convair, Pomona Division, General Dynamics Corp., Pomona, Calif.	898
Corning Glass Works, Corning, N. Y.	148
Cornish Wire Company, Inc., New York 7, N. Y.	149
Cosmic Radio Corporation, New York 59, N. Y.	704
Croname, Incorporated, Chicago 48, Ill.	151
Crosley Division, Avco Mfg. Corp., Cincinnati 25, Ohio	152
Cubic Corporation, San Diego 11, Calif.	870
Dale Products, Inc., Columbus, Nebr.	816
*Datex Corporation, Monrovia, Calif.	943
J. W. Davis & Company, Dallas 35, Texas	563
*Davis Electric Company, Cape Girardeau, Mo.	628
*Dearborn Glass Company, Bedford Park, Ill.	385
DeJur-Amsco Corporation, Long Island City 1, N. Y.	780
Delco Radio Division, General Motors Corporation, Kokomo, Ind.	466
*Tobe Deutschmann Corp., Norwood, Mass.	154
*DeWald, Div. of United Scientific Labs. Inc., Long Island City 1, N. Y.	155
*Dinion Coil Co., Inc., Caledonia, N. Y.	895
R. L. Drake Company, Miamisburg, Ohio	851
Drake Manufacturing Company, Chicago 22, Ill.	586
*Dresco Industries, Beverly Hills, Calif.	785
Wilbur B. Driver Company, Newark 4, N. J.	156
DuKane Corporation, St. Charles, Ill.	252
Allen B. DuMont Laboratories, Inc., Tube Operations Div., Clifton, N. J.	158
*Dunleavey Electronics Corporation, Stoughton, Mass.	1046
*DX Radio Products Company, Inc., Chicago 47, Ill.	159
Eberline Instrument Corporation, Santa Fe, N. M.	894
*Hugh H. Eby Company, Philadelphia 44, Penna.	160
Eitel-McCullough, Inc., San Carlos, Calif.	162
*Elco Corporation, Philadelphia 24, Penna.	599
Eldíco Electronics, Division of Radio Engineering Laboratories, Inc., Long Island City, N. Y.	783
*Electrical Utilities Company, La Salle, Ill.	569
*Electrical Windings, Inc., Chicago 39, Ill.	682
*Electro Engineering Works, San Leandro, Calif.	1033
The Electro Motive Mfg. Co., Inc., Willimantic, Conn.	164
*Electronic Components Corporation, Chicago 8, Ill.	515
*Electronic Devices, Inc., Brooklyn 15, N. Y.	752
*Electronic Engineering Company of California, Santa Ana, Calif.	941
*Electronic Enterprises, Inc., Newark 4, N. J.	545
*Electronic Specialty Co., Los Angeles 39, Calif.	169
Electronic Tube Corporation, Philadelphia 18, Penna.	170
Electrons, Incorporated, Newark 3, N. J.	935
Electro-Products, Inc., Detroit 27, Mich.	903
*Electro-Voice, Inc., Buchanan, Mich.	649
*Electro-Winders Co., Inc., Covina, Calif.	984
Elgin Metalformers Corporation, Elgin, Ill.	902
*El-Rad Manufacturing Co., Chicago 18, Ill.	632
*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.	171
Ensign Coil Company, Chicago 23, Ill.	172
Entron Inc.. Bladensburg, Md.	1058
Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.	762
Erie Resistor Corporation, Erie, Pa.	173
*ESC Corporation, Palisades Park, N. J.	1069
*Esquire Radio Corporation, Brooklyn 19, N. Y.	742
*Essex Electronics, Berkeley Heights, N. J.	425
*Essex Wire Corporation, Fort Wayne 6, Ind.	175
John E. Fast & Company, Chicago 18, Ill.	178
*Fastex Division, Illinois Tool Works, Des Plaines, Ill.	1
Ferranti Electric, Inc., New York 20, N. Y.	1040
*Filtors, Inc., Port Washington, L. I., N. Y.	977
*Fischer Electric Co., Inc., De Leon Springs, Fla.	1006
*Florida-Merit Inc., Hollywood, Fla.	987
Forbes & Wagner, Inc., Silver Creek, N. Y.	701
Foto-Video Laboratories, Inc., Cedar Grove, N. J.	963
*The Forest Electric Company, Forest Park, Ill.	773
*Foster Transformer Company, Cincinnati 23, Ohio	394
*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.	746
*Fugle-Miller Laboratories, Clark, N. J.	1003
*F. & V. Coil Winding Corporation, Newark 5, N. J.	572
*Gahagan, Inc., Esmond 17, R. I.	1057
*Gates Radio Company, Quincy, Ill.	187
*Gavitt Wire & Cable Co., Division of Amerace Corp., Brookfield, Mass.	360
*Gefco Manufacturing Company, Grayslake, Ill.	1056
*General Cable Corporation, Perth Amboy, N. J.	571
General Cement Mfg. Co., Div. Textron, Inc., Rockford, Ill.	396
General Electric Company, Syracuse 1, N. Y.	188
*General Electronics, Inc., Paterson 3, N. J.	189
The General Industries Company, Elyria, Ohio	190
General Instrument Corporation, Newark 4, N. J.	191
General Magnetic Corporation, Detroit 34, Mich.	193
General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.	927
*General Precision Laboratory Inc., Pleasantville, N. Y.	582
General Products Corporation, Union Springs, N. Y.	913
General Radio Company, Cambridge 39, Mass.	194
General Railway Signal Company, Rochester 2, N. Y.	544
*General Transformer Company, Homewood, Ill.	412
General Transistor Corporation, Jamaica 35, N. Y.	950
Glaser-Steers Corporation, Newark 4, N. J.	670
*Glass Products Company, Santa Barbara, Calif.	475
The Fred Goat Co., Inc., Brooklyn 17, N. Y.	197
Good-All Electric Mfg Co., Ogalalla, Nebr.	446
*Gonset Division, Young Spring & Wire Corp., Burbank, Calif.	983
*Gordos Corporation, Bloomfield, N. J.	806
*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.	596
*Grand Coil Winders, Grand Haven, Mich.	996
*Grand Transformers, Inc., Grand Haven, Mich.	757
Grayhill, La Grange, Ill.	992
*Gray & Kuhn Inc., Roslyn Heights, N. Y.	1028
Gremar Manufacturing Co., Inc., Wakefield, Mass.	1045
The Grigsby Company, Inc., Arlington Heights, Ill.	467
The Gudeman Company, Chicago 10, Ill.	438
*Guthman Division, Essex Wire Corp., Chicago 7, Ill.	198
*The Hallicrafters Co., Chicago 24, Ill.	199
*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.	936
Hammarlund Mfg. Co., Inc., New York 1, N. Y.	201
Hardwick, Hindle, Inc., Newark 5, N. J.	411
Hawley Products Company, St. Charles, Ill.	204
Haydu Electronic Products, Inc., Plainfield, N. J.	205
Hazeltine Corporation, Little Neck 62, N. Y.	376
*Henald Manufacturing Co. Inc., Piper City, Ill.	808
*Hermetic Seal Transformer Co., Div. of S.I.E., Garland, Tex.	1072
*Heppner Manufacturing Company, Round Lake, Ill.	575
The Hickok Electrical Instrument Co., Cleveland 8, O.	508
*Hillburn Electronic Products Co., Brooklyn 22, N. Y.	687
*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forest Hills 74, N. Y.	786
Hi-Q Division Aerovox Corporation, Olean, N. Y.	163
Hoffman Electronics Corporation, Los Angeles 7, Calif.	207
*Holiday Transformer Corporation, Chicago 14, Ill.	1038
*Holyoke Wire and Cable Corporation, Holyoke, Mass.	372
*Hopkins Engineering Company, San Fernando, Calif.	791
*Horton and Hubbard Manufacturing Co., Nashua, N. H.	1076
Huggins Laboratories, Inc., Sunnyvale, Calif.	964
Hughes Aircraft Company, Culver City, Calif.	744
Hycon Mfg. Company, Pasadena, Calif.	1007
Hy-Gain Antenna Products Company, Lincoln 4, Nebr.	894
Illinois Condenser Company, Chicago 22, Ill.	616
*The Indiana Steel Products Company, Valparaiso, Ind.	211
*Inductor Engineering, Inc., Lewes, Del.	915
Industrial Development Engineering Associates, Inc. Indianapolis 26, Ind.	538
*Industrial Hardware Manufacturing Co., Inc., New York 12, N. Y.	866
*Industrial Television, Inc., Clifton, N. J.	541
*Industrial Tubes, Inc., Geneva, Ill.	972
Industro Transistor Corporation, Long Island City 6, N. Y.	1053
International Electronic Industries, Inc., Nashville 1, Tenn.	911
International Electronics Corp., New York 12, N. Y.	1022
International Electronic Research Corp., Burbank, Calif.	1023
International Instruments, Inc., West Haven, Conn.	855
International Rectifier Corporation, El Segundo, Calif.	845
International Resistance Company, Philadelphia 8, Pa.	214
International Telephone and Telegraph Corporation ITT Federal Division, Ft. Wayne, Ind.	936
ITT Federal Division, Clifton, N. J.	179
*Ion Capacitor Corp., Columbia City, Ind.	1013
Jackson Electrical Instrument Co., Dayton 2, Ohio	216
*James Vibrapowr Company, Chicago 18, Ill.	863
J-B-T Instruments, Inc., New Haven 8, Conn.	442
Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.	724
*Jefferson Electric Company, Bellwood, Ill.	218
Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.	220
Jerrold Electronics Corporation, Philadelphia 32, Pa.	923
Jersey Specialty Co., Inc., Wayne, N. J.	730
*Jet Electronics Corporation, Glendale 4, Calif.	1004
JFD Electronics, Inc., Brooklyn 4, N. Y.	221
*J & G Machine Company, Inc., Worcester 8, Mass.	945
E. F. Johnson Company, Inc., Waseca, Minn.	222

Company	Code No.
Johnson Electronics Inc., Casselberry, Fla.	784
Kay Electric Company, Pine Brook, N. J.	620
*Kemtron Electron Products, Inc., Newburyport, Mass.	1016
Kentron Hawaii Ltd., Honolulu 14, Hawaii	1054
Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.	223
Kester Solder Company, Chicago 39, Ill.	224
*Keystone Electronics Company, Newark 4, N. J.	699
Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio	647
King Laboratories, Inc., Syracuse 3, N. Y.	225
*Kin Tel, Division of Cohu Electronics, Inc., San Diego 11, Calif.	925
Kip Electronics Corporation, Stamford, Conn.	593
*Kline Iron and Steel Company, Columbia, S. C.	869
*The James Knights Company, Sandwich, Ill.	504
*Kobzy Tool Company, Chicago 22, Ill.	594
Kost Products Company, Inc., Chicago 39, Ill.	951
Leach Corporation, Compton, Calif.	1024
*Lear, Inc., Santa Monica, Calif.	227
*Lectrohm, Inc., Chicago 30, Ill.	974
Lenz Electric Manufacturing Co., Chicago 47, Ill.	228
*Leonard Electric Products Co., Inc., Brooklyn 32, N. Y.	570
Littelfuse, Incorporated, Des Plaines, Ill.	230
Litton Industries, Beverly Hills, Calif.	879
Lowell Manufacturing Company, St. Louis 17, Mo.	657
*Lumen, Inc., Joliet, Ill.	1078
*Lytle Engineering Co., Chicago 1, Ill.	671
Machlett Laboratories, Incorporated, Springdale, Conn.	231
The Magnavox Company, Fort Wayne 4, Ind.	232
*Magnetic Coil Manufacturing Company, Chicago 22, Ill.	933
*Magnetic Windings Division (Essex Wire Corporation), Easton, Pa.	352
P. R. Mallory & Co., Inc., Indianapolis 6, Ind.	235
*Marvel Electric Corporation, Chicago 22, Ill.	989
*Mayfair Molded Products Corporation, Schiller Park, Ill.	1041
McCoy Electronics Co., Mt. Holly Springs, Penna.	832
McGregor Electronic Industries, Inc., McGregor, Ia.	789
*McIntosh Laboratory, Inc., Binghamton, N. Y.	793
Measurements Div., McGraw-Edison Co., Boonton, N. J.	236
*Mel-Rain Corporation, Indianapolis 3, Ind.	834
*Melrose Products, Inc., Willow Grove, Pa.	1083
Merit Coil & Transformer Corp., Hollywood, Fla.	239
*Metals & Controls Corp., Attleboro, Mass.	1075
*Methode Manufacturing Corp., Chicago 47, Ill.	720
Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Brooklyn 37, N. Y.	240
*Microtran Company, Inc., Valley Stream, L. I., N. Y.	768
Midland Manufacturing Co., Inc., Kansas City 15, Kan.	828
*Mid-West Coil & Transformer Co., Chicago 14, Ill.	549
Midwest Speaker Company, McGregor, Iowa	993
James Millen Manufacturing Co., Inc., Malden 48, Mass.	242
Milwaukee Resistor Company, Milwaukee 4, Wis.	722
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.	1087
M.E.C., Inc., Nashville 4, Tenn.	885
*Model Engineering & Manufacturing Inc., Chicago 18, Ill.	976
Moloney Electric Company, St. Louis 20, Mo.	965
Mosley Electronics, Incorporated, St. Louis 14, Mo.	750
Motorola Inc., Chicago 51, Ill.	185
Mullenbach Division of Electric Machinery Mfg. Co., Los Angeles 58, Calif.	966
Multi-Tron Laboratory, Inc., Westchester, Ill.	693
The Muter Company, Chicago 5, Ill.	244
Mycalex Corporation of America, Clifton, N. J.	642
*National Aeronautical Corporation, Fort Washington, Pa.	643
*National Company, Inc., Malden 48, Mass.	245
*National Electronics, Inc., Geneva, Ill.	749
*National Tel-Tronics Corp., Yonkers, N. Y.	999
*National Video Corporation, Chicago 32, Ill.	838
*Newcomb Electronics Corporation, Hollywood 38, Calif.	437
*New York Transformer Co., Inc., Alpha, N. J.	366
North American Aviation, Inc., Los Angeles 45, Calif.	967
North American Philips Company, Inc., New York 17, N. Y.	423
Northwest Plastics, Inc., St. Paul 7, Minn.	723
Nortronics, A Div. of Northrop Aircraft, Inc., Hawthorne, Calif.	1079
*NYT Electronics, Inc., Burbank, Calif.	1030
Oak Electronics Company, Buffalo 3, N. Y.	739
Oak Mfg. Co., Chicago 10, Ill.	249
*Oaktron Electric Company, Tinley Park, Ill.	934
*Oaktron Industries Inc., Monroe, Wis.	918
*Ogden Coil & Transformer Co., Chicago 12, Ill.	776
The Ohio Carbon Company, Cleveland 11, Ohio	250
Ohmite Manufacturing Company, Skokie, Ill.	251
Olympic Products Co., Inc., Alpha 1, N. J.	740
Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.	200
Onondaga Pottery Company, Electronics Division, Syracuse 1, N. Y.	848
*Ontario Industries, Inc., Hornell, N. Y.	960
Orradio Industries, Inc., Opelika, Ala.	540
Otis Radio & Electric Corp., Hawarden, Iowa	552
Oxford Electric Corporation, Chicago 15, Ill.	465
*Pacific Mercury Electronics, Sepulveda, Calif.	1086
Pacific Semiconductors, Inc., Culver City, Calif.	947
Packard Bell Electronics Corp., Los Angeles 64, Calif.	254
Parker Metal Goods Company, Worcester 8, Mass.	929
*Park Products Company, Cleveland 3, Ohio	1011
*PCA Electronics Inc., Sepulveda, Calif.	973
*Peirce Wire Recorder Corporation, Chicago 31, Ill.	279
Penn Tran Corporation, Bellefonte, Pa.	665
Penta Laboratories, Inc., Santa Barbara, Calif.	771
*Phalo Plastics Corporation, Shrewsbury, Mass.	697
Philco Corporation, Philadelphia 34, Pa.	260
Philco Corporation, Accessory Division, Philadelphia, Pa.	1063
*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.	262
*Pickering and Company, Inc., Plainview, L. I., N. Y.	631
*Piezo Crystal Company, Carlisle, Pa.	501
Pilot Radio Corporation, Long Island City 1, N. Y.	264
Pioneer Electronics Corporation, Los Angeles 64, Calif.	706
*Planet Manufacturing Corporation, Bloomfield, N. J.	761
*Polan Industries, Inc., Huntington 19, W. Va.	621
Pomona Electronics Co., Inc., Pomona, Calif.	1050
Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.	505
*Precision Electronic Coil Manufacturing Co., Santa Monica, Calif.	982
Precision Electronics Inc., Franklin Park, Ill.	871
Presto Recording Company, Div., The Siegler Corp., Paramus, N. J.	1027
Prodelin, Inc., Kearny, N. J.	703
*Pyramid Electric Company, North Bergen, N. J.	472
*Q. L. C. Corporation, Long Valley, N. J.	464
*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.	1005
Quam-Nichols Company, Chicago 37, Ill.	270
*Quik-Chek Corporation, Philadelphia 44, Pa.	743
Quincy Speaker Manufacturing Corp., Quincy, Ill.	767
Radio Condenser Company, Camden 3, N. J.	273
Radio Corporation of America, Camden, N. J.	274
Radio Development & Research Corp., Paterson 3, N. J.	924
Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.	276
*Radio Industries, Inc., Des Plaines, Ill.	540
Radio Materials Company, Div. P. R. Mallory & Co., Inc., Chicago 18, Ill.	732
*The Radion Corporation, Crystal Lake, Ill.	700
Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.	380
Radio Specialty Manufacturing Co., Portland 14, Oregon	587
*Radio Television Products Corp., Grass Lake, Mich.	489
RAM Electronics, Inc., Paramus, N. J.	617
Rapid Die and Molding Co., Schiller Park, Ill.	968
*Ratel, Inc., Goleta, Calif.	835
Ratigan Electronics Inc., Glendale 4, Calif.	979
Raytheon Manufacturing Company, Waltham 54, Mass.	280
Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.	281
Red Bank Division, Bendix Aviation Corp., Eatontown, N. J.	1012
*Red Lion Cabinet Company, Red Lion, Pa.	384
Remler Company, San Francisco 10, Calif.	284
Resitron Laboratories, Inc., Santa Monica, Calif.	917
Rheem Manufacturing Co., Defense & Technical Products Div., Downey, Calif.	1042
Rhein Sound Systems, Inc., New Haven 5, Conn.	952
*Rogers Corporation, Rogers, Conn.	1055
*Rogers Electronic Corp., New York 12, N. Y.	677
The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio	285
*Rollan Electric Co., Chicago 20, Ill.	721
The Ross Manufacturing Company, Chicago 45, Ill.	286
*Rowe Industries, Toledo 9, Ohio	580
*Russell Speaker Company, Chicago 21, Ill.	748
S & A Electronics, Toledo 5, Ohio	872
*Sampson Electric Products Co., Clinton, N. C.	518
San Fernando Electric Mfg. Co., San Fernando, Calif.	815
Sangamo Electric Company, Electronic Components Division, Springfield, Ill.	658
*Santay Corporation, Chicago 24, Ill.	368
*Sarkes Tarzian, Inc., Bloomington, Ind.	884
Schneider & Marquard, Inc., Newton, N. J.	520
*Schulmerich Carillons, Inc., Sellersville, Penna.	428
*Schwalm Electronics, Inc., Highland Park, Ill.	1060
Scientific Radio Products, Inc., Loveland, Colo.	953
Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.	291
Sheffco Mfg. Corp., Fairview, N. J.	698
*Sherold Crystals Inc., Kansas City 8, Mo.	975
*Sherron Electronics Company, Brooklyn 37, N. Y.	293
Shurite Meters (J-B-T Instruments, Inc.), New Haven 8, Conn.	484

Company	Code No.
F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.	294
Simpson Electric Company, Chicago 44, Ill.	614
*Mark Simpson Manufacturing Co., Inc., Long Island City 3, N. Y.	295
Skiatron Electronics & Television Corp., New York 14, N. Y.	931
*Paul Smith, Inc., Cincinnati 9, Ohio	1070
SNC Manufacturing Co., Inc., Oshkosh, Wis.	1080
*Solar Manufacturing Corporation, Los Angeles 58, Calif.	296
*Sonotone Corporation, Elmsford, N. Y.	787
Soundolier, Inc., St. Louis 22, Mo.	1026
Southern Electronics Company, Greeneville, Tenn.	891
*South Haven Coil, Inc., South Haven, Mich.	1066
*Sparton Electronics, Division of Sparton Corporation, Jackson, Mich.	299
Speer Resistor Division, Speer Carbon Company, Bradford, Penna.	300
*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.	782
Sprague Electric Company, North Adams, Mass.	303
Sprague of Wisconsin, Inc., Grafton, Wis.	457
Stackpole Carbon Company, St. Marys 3, Pa.	304
*Standard Coil Products Co. Inc., Melrose Park, Ill.	305
*Standard Condenser Corp., Chicago 13, Ill.	710
Standard Crystal Company, Kansas City 8, Mo.	995
*Standard Electrical Products Co., Dayton 3, Ohio	668
*Standard Electromagnetics Inc., Frederick, Md.	1077
Standard Electronics, Division of Radio Engineering Labs., Inc., Long Island City 1, N. Y.	694
Standard Television Tube Corp., New Orleans 12, La.	922
*Standard Winding Company, Newburgh, N. Y.	550
*Stanwyck Winding Company, Newburgh, N. Y.	574
The Staver Company Incorporated, Bay Shore, L. I., N. Y.	604
*Stewart-Warner Electronics, Div. of Stewart-Warner Corporation, Chicago 51, Ill.	307
Stone City Machine & Tool Co., Inc., Bedford, Ind.	770
Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.	308
*Sun Capacitors, Chicago 25, Ill.	1061
*Supreme Transformer Corporation, Chicago 39, Ill.	798
Surprenant Mfg. Co., Boston 8, Mass.	624
Switchcraft, Inc., Chicago 30, Ill.	1000
Sylvania Electric Products Inc., New York 19, N. Y.	312
*Symphonic Electronic Corp., New Brunswick, N. J.	351
Syncro Corporation, Electronics Div., Hicksville, Ohio	1081
*Syntronic Instruments, Inc., Addison, Ill.	822
Talk-A-Phone Co., Chicago 23, Ill.	132
Tansitor Electronics, Inc., Bennington, Vt.	988
*Tech-Master Corporation, Brooklyn 1, N. Y.	679
Technical Training Institute, Portland 11, Ore.	921
Telechrome Mfg. Corp., Amityville, N. Y.	868
Telemeter Magnetics, Inc., Los Angeles 64, Calif.	887
*Telequip Radio Company, Chicago 8, Ill.	454
*Teleradio Engineering Corporation, Wilkes Barre, Pa.	357
*TELvision Laboratories, Inc., Wauconda, Ill.	608
Temco Aircraft Corporation, Dallas 22, Tex.	1065
*Tempel Steel Company, Chicago 26, Ill.	745
The Tetrad Company, Yonkers 2, N. Y.	842
Texas Instruments Incorporated, Dallas 9, Tex.	980
*Thermador Electrical Mfg. Co., Div. of Norris-Thermador Corp., Los Angeles 22, Calif.	825
*Thomas & Skinner Inc., Indianapolis 7, Ind.	318
Thomas Electronics, Inc., Passaic, N. J.	672
*Thordarson-Meissner, Mt. Carmel, Ill.	238
*Todd Electric Company, Inc., Yonkers, N. Y.	926
*B. J. Toegel, Inc., Plainfield, N. J.	548
*Torwico Electronics, Inc., Union, N. J.	1025
*Trad Electronics Corporation, Asbury Park, N. J.	688
*Transcon Manufacturing Co., Dallas 9, Tex.	1084
*Transformer Manufacturers, Inc., Chicago 30, Ill.	1052
*Transitron Electronic Corporation, Wakefield, Mass.	959
Translite Electronics Corp., Chicago 39, Ill.	810
Trav-Ler Radio Corporation, Chicago 6, Ill.	320
Tresco, Inc., Philadelphia 28, Penna.	897
Triad Transformer Corporation, Venice, Calif.	830
Triplett Electrical Instrument Co., Bluffton, Ohio	321
*Tritron Company, Milwaukee 12, Wis.	1085
*Triwec-Transformer Company, Chicago 18, Ill.	524
Tung-Sol Electric Inc., Newark 4, N. J.	322
*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.	1073
Union City Filament Corp., Union City, N. J.	954
*Union Electric & Manufacturing Co., Jersey City 7, N. J.	804
United Condenser Corporation, New York 56, N. Y.	516
United Electronics Company, Newark 4, N. J.	323
*United Electronic Manufacturing Corp., Union City, N. J.	820
*United States Dynamics Corporation, Boston 20, Mass.	997
*United States Radium Corporation, Morristown, N. J.	324
United Transformer Corporation, New York 13, N. Y.	418
*Unitek Corporation, Pasadena 8, Calif.	881
*Utah Radio Products Corp., Huntington, Ind.	328
*Utrad Corporation, Huntington, Ind.	1036
Vacuum Tube Products Co., Inc., Oceanside, Calif.	781
Valpey Crystal Corporation, Holliston, Mass.	527
Varian Associates, Palo Alto, Calif.	809
Vector Electronic Company, Glendale, Calif.	971
Vidaire Electronics Mfg. Corp., Baldwin, N. Y.	797
*Videocraft Manufacturing Co., Chicago 39, Ill.	824
Vitramon, Inc., Bridgeport 1, Conn.	956
*V-M Corporation, Benton Harbor, Mich.	857
*Vokar Company, Ann Arbor, Mich.	168
Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.	507
*Ward Leonard Electric Co., Mount Vernon, N. Y.	532
Warwick Manufacturing Corporation, Chicago 48, Ill.	332
Waterman Products Company, Inc., Philadelphia 25, Pa.	431
Waters Conley Company, Inc., Rochester, Minn.	382
*WEBCOR, Inc., Chicago 39, Ill.	375
Weller Electric Corporation, Easton, Pa.	662
*Wells Electronics Company, South Bend 23, Ind.	1074
Wells-Gardner & Co., Chicago 39, Ill.	334
Wm. H. Welsh Co., Inc., Chicago 16, Ill.	335
*Wesco Electrical and Manufacturing Company, Greenfield, Mass.	1067
Western Electric Company, Inc., New York 5, N. Y.	336
Westinghouse Electric Corporation, Baltimore 3, Md.	337
Weston Instruments, Div. of Daystrom, Inc., Newark 12, N. J.	338
*Wheeler Electronic Corporation, Waterbury 20, Conn.	392
Wheeler Laboratories, Inc., Great Neck, N. Y.	529
*Whitewater Electronics Inc., Whitewater, Wis.	758
*Wilcox Electric Company, Inc., Kansas City 27, Mo.	339
*Winchester Electronics, Inc., Norwalk, Conn.	1082
Wind Turbine Company, West Chester, Pa.	653
Winston Electronics, Inc., Philadelphia 27, Pa.	957
*Wirco Electronics, Inc., El Monte, Calif.	1049
*Wirt Company, Philadelphia 44, Penna.	406
*Woodward-Schumacher Electric Corp., Chicago 22, Ill.	606
Wright Zimmerman, Inc., New Brighton, Minn.	683
*The Zell Products Corp., Norwalk, Conn.	342
Zenith Radio Corporation, Chicago 39, Ill.	343
Z & W Mfg. Corp., Wickliffe, Ohio	819

NUMERICAL LIST

EIA Production Source Code Symbols

(* Indicates non-members)

Code No.	Company
1	*Fastex Division, Illinois Tool Works, Des Plaines, Ill.
101	*Admiral Corporation, Chicago 47, Ill.
102	Aerovox Corporation, New Bedford, Mass.
106	Allen-Bradley Company, Milwaukee 4, Wis.
107	The Alliance Manufacturing Co., Inc., Alliance, Ohio
110	All Star Products, Inc., Defiance, Ohio
111	Amperex Electronic Corporation, Hicksville, L. I., N. Y.
113	*Andrea Radio Corporation, Long Island City 1, N. Y.
115	A. R. F. Products, Inc., River Forest, Ill.
116	The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.
119	Automatic Manufacturing Division, General Instrument Corp., Newark 4, N. J.
120	Automatic Radio Mfg. Co., Inc., Boston 15, Mass.
122	The Bead Chain Manufacturing Co., Bridgeport 5, Conn.
125	Bendix Radio, Division of Bendix Aviation Corporation, Baltimore 4, Md.
128	Bliley Electric Company, Erie, Pa.
132	Talk-A-Phone Co., Chicago 23, Ill.
133	C. F. Cannon Co., Springwater, N. Y.
134	Centralab, Div. of Globe-Union Inc., Milwaukee 1, Wis.
135	Chicago Condenser Corporation, Chicago 47, Ill.
137	Chicago Telephone Supply Corp., Elkhart, Ind.
138	*Chicago Standard Transformer Division, Essex Wire Corp., Chicago 18, Ill.
139	Cinch Manufacturing Corporation, Chicago 24, Ill.
140	Clarostat Mfg. Co., Inc., Dover, New Hampshire
141	*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.
145	*Cinaudagraph Inc., Chicago 26, Ill.
146	Continental Carbon, Div. of Wirt Company, Philadelphia 44, Pa.
147	Continental Electric Company, Chicago 2, Ill.
148	Corning Glass Works, Corning, N. Y.
149	Cornish Wire Company, Inc., New York 7, N. Y.
151	Croname, Incorporated, Chicago 48, Ill.

Code No.	Company
152	Crosley Division, Avco Mfg. Corp., Cincinnati 25, Ohio
154	*Tobe Deutschmann Corp., Norwood, Mass.
155	*DeWald, Div. of United Scientific Labs., Inc., Long Island City 1, N. Y.
156	Wilbur B. Driver Company, Newark 4, N. J.
158	Allen B. DuMont Laboratories, Inc., Tube Operations Div., Clifton, N. J.
159	*DX Radio Products Company, Inc., Chicago 47, Ill.
160	*Hugh H. Eby Company, Philadelphia 44, Penna.
162	Eitel-McCullough, Inc., San Carlos, Calif.
163	Hi-Q Division Aerovox Corporation, Olean, N. Y.
164	The Electro Motive Mfg. Co., Inc., Willimantic, Conn.
166	*Chicago Electronic Engineering Co., Chicago 47, Ill.
168	*Vokar Company, Ann Arbor, Mich.
169	*Electronic Specialty Co., Los Angeles 39, Calif.
170	Electronic Tube Corporation, Philadelphia 18, Pa.
171	*Emerson Radio & Phonograph Corp., Jersey City 2, N. J.
172	Ensign Coil Company, Chicago 23, Ill.
173	Erie Resistor Corporation, Erie, Pa.
175	*Essex Wire Corporation, Fort Wayne 6, Ind.
178	John E. Fast & Company, Chicago 18, Ill.
179	ITT Federal Division, Clifton, N. J.
185	Motorola Inc., Chicago 51, Ill.
187	*Gates Radio Company, Quincy, Ill.
188	General Electric Company, Syracuse 1, N. Y.
189	*General Electronics, Inc., Paterson 3, N. J.
190	The General Industries Company, Elyria, Ohio
191	General Instrument Corporation, Newark 4, N. J.
193	General Magnetic Corporation, Detroit 34, Mich.
194	General Radio Company, Cambridge 39, Mass.
197	The Fred Goat Co., Inc., Brooklyn 17, N. Y.
198	*Guthman Division, Essex Wire Corp., Chicago 7, Ill.
199	*The Hallicrafters Company, Chicago 24, Ill.
200	Olympic Radio & Television, Div. The Siegler Corp., Long Island City 1, N. Y.
201	Hammarlund Mfg. Co., Inc., New York 1, N. Y.
204	Hawley Products Company, St. Charles, Ill.
205	Haydu Electronic Products, Inc., Plainfield, N. J.
207	Hoffman Electronics Corporation, Los Angeles 7, Calif.
210	CBS-Hytron, Division of Columbia Broadcasting System, Inc., Danvers, Mass.
211	*The Indiana Steel Products Company, Valparaiso, Ind.
214	International Resistance Company, Philadelphia 8, Pa.
216	Jackson Electrical Instrument Co., Dayton 2, Ohio
218	*Jefferson Electric Company, Bellwood, Ill.
220	Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.
221	JFD Electronics, Inc., Brooklyn 4, N. Y.
222	E. F. Johnson Company, Inc., Waseca, Minn.
223	Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.
224	Kester Solder Company, Chicago 39, Ill.
225	King Laboratories, Inc., Syracuse 3, N. Y.
227	*Lear, Inc., Santa Monica, Calif.
228	Lenz Electric Manufacturing Co., Chicago 47, Ill.
230	Littelfuse, Incorporated, Des Plaines, Ill.
231	Machlett Laboratories, Incorporated, Springdale, Conn.
232	The Magnavox Company, Fort Wayne 4, Ind.
235	P. R. Mallory & Co., Inc., Indianapolis 6, Ind.
236	Measurements Div., McGraw-Edison Co., Boonton, N. J.
238	*Thordarson-Meissner, Mt. Carmel, Ill.
239	Merit Coil & Transformer Corp., Hollywood, Fla.
240	Micamold Electronics Manufacturing Corp., Sub. General Instrument Corp., Brooklyn 37, N. Y.
242	James Millen Manufacturing Co., Inc., Malden 48, Mass.
244	The Muter Company, Chicago 5, Ill.
245	*National Company, Inc., Malden 48, Mass.
248	Arvin Industries, Inc., Columbus, Ind.
249	Oak Mfg. Co., Chicago 10, Ill.
250	The Ohio Carbon Company, Cleveland 11, Ohio
251	Ohmite Manufacturing Company, Skokie, Ill.
252	DuKane Corporation, St. Charles, Ill.
254	Packard Bell Electronics Corp., Los Angeles 64, Calif.
260	Philco Corporation, Philadelphia 34, Pa.
262	*Philmore Manufacturing Co., Inc., Richmond Hill 18, N. Y.
264	Pilot Radio Corporation, Long Island City 1, N. Y.
270	Quam-Nichols Company, Chicago 37, Ill.
273	Radio Condenser Company, Camden 3, N. J.
274	Radio Corporation of America, Camden, N. J.
276	Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.
279	*Peirce Wire Recorder Corporation, Chicago 31, Ill.
280	Raytheon Manufacturing Company, Waltham 54, Mass.
281	Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.
284	Remler Company, San Francisco 10, Calif.
285	The Rola Company, Inc., Div. of The Muter Company, Cleveland 14, Ohio
286	The Ross Manufacturing Company, Chicago 45, Ill.
291	Sentinel Radio Company, Sub. Magnavox Company, Evanston, Ill.
293	*Sherron Electronics Company, Brooklyn 37, N. Y.
294	F. W. Sickles Division, General Instrument Corp., Chicopee, Mass.
295	*Mark Simpson Manufacturing Co., Inc. Long Island City 3, N. Y.
296	*Solar Manufacturing Corporation, Los Angeles 58, Calif.
299	*Sparton Electronics, Division of Sparton Corporation, Jackson, Mich.
300	Speer Resistor Division, Speer Carbon Company, Bradford, Pa.
303	Sprague Electric Company, North Adams, Mass.
304	Stackpole Carbon Company, St. Marys 3, Pa.
305	*Standard Coil Products Co. Inc., Melrose Park, Ill.
307	*Stewart-Warner Electronics, Div. of Stewart-Warner Corporation, Chicago 51, Ill.
308	Stromberg-Carlson, Div. of General Dynamics Corp., Rochester 3, N. Y.
312	Sylvania Electric Products Inc., New York 19, N. Y.
318	*Thomas & Skinner, Inc., Indianapolis 7, Ind.
320	Trav-Ler Radio Corporation, Chicago 6, Ill.
321	Triplett Electrical Instrument Co., Bluffton, Ohio
322	Tung-Sol Electric Inc., Newark 4, N. J.
323	United Electronics Company, Newark 4, N. J.
324	*United States Radium Corporation, Morristown, N. J.
328	*Utah Radio Products Corp., Huntington, Ind.
332	Warwick Manufacturing Corporation, Chicago 48, Ill.
334	Wells-Gardner & Co., Chicago 39, Ill.
335	Wm. H. Welsh Co., Inc., Chicago 16, Ill.
336	Western Electric Company, Inc., New York 5, N. Y.
337	Westinghouse Electric Corporation, Baltimore 3, Md.
338	Weston Instruments, Div. of Daystrom, Inc., Newark 12, N. J.
339	*Wilcox Electric Company, Inc., Kansas City 27, Mo.
342	*The Zell Products Corp., Norwalk, Conn.
343	Zenith Radio Corporation, Chicago 39, Ill.
351	*Symphonic Electronic Corp., New Brunswick, N. J.
352	*Magnetic Windings Division, Essex Wire Corporation, Easton, Penna.
357	*Teleradio Engineering Corporation, Wilkes Barre, Pa.
360	*Gavitt Wire & Cable Co., Division of Amerace Corp., Brookfield, Mass.
366	*New York Transformer Co., Inc., Alpha, N. J.
368	*Santay Corporation, Chicago 24, Ill.
371	*Best Manufacturing Co., Inc., Irvington 11, N. J.
372	*Holyoke Wire and Cable Corporation, Holyoke, Mass.
375	*WEBCOR, Inc., Chicago 39, Ill.
376	Hazeltine Corporation, Little Neck, 62, N. Y.
380	Radio Receptor Company, Inc., Sub. General Instrument Corp., Brooklyn 11, N. Y.
382	Waters Conley Company, Inc., Rochester, Minn.
384	*Red Lion Cabinet Company, Red Lion, Pa.
385	*Dearborn Glass Company, Bedford Park, Ill.
391	Altec Lansing Corporation, Anaheim, Calif.
392	*Wheeler Electronic Corporation, Waterbury 20, Conn.
394	*Foster Transformer Company, Cincinnati 23, Ohio
396	General Cement Mfg. Co., Div. Textron, Inc., Rockford, Ill.
402	Andrew Corporation, Chicago 19, Ill.
406	*Wirt Company, Philadelphia 44, Penna.
409	British Industries Corporation, Port Washington, L. I., N. Y.
411	Hardwick, Hindle, Inc., Newark 5, N. J.
412	*General Transformer Company, Homewood, Ill.
413	*Acme Electric Corporation, Cuba, N. Y.
418	United Transformer Corporation, New York 13, N. Y.
423	North American Philips Company, Inc., New York 17, N. Y.
425	*Essex Electronics, Berkeley Heights, N. J.
427	*Communication Measurements Laboratory, Inc., Plainfield, N. J.
428	*Schulmerich Carillons, Inc., Sellersville, Penna.
431	Waterman Products Company, Inc., Philadelphia 25, Pa.
433	*Cleveland Electronics, Inc., Cleveland 3, Ohio
437	*Newcomb Electronics Corporation, Hollywood 38, Calif.
438	The Gudeman Company, Chicago 10, Ill.
439	Collins Radio Company, Cedar Rapids, Ia.
442	J-B-T Instruments, Inc., New Haven 8, Conn.
446	Good-All Electric Mfg. Co., Ogallala, Nebr.
450	*Columbus Process Co., Inc., Columbus, Ind.
454	*Telequip Radio Company, Chicago 8, Ill.
457	Sprague of Wisconsin, Inc., Grafton, Wis.
461	Barker & Williamson, Inc., Bristol, Penna.
464	*Q. L. C. Corporation, Long Valley, N. J.
465	Oxford Electric Corporation, Chicago 15, Ill.
466	Delco Radio Division, General Motors Corporation, Kokomo, Ind.
467	The Grigsby Company, Inc., Arlington Heights, Ill.
472	*Pyramid Electric Company, North Bergen, N. J.
475	*Glass Products Company, Chicago 37, Ill.
484	Shurite Meters (J-B-T Instruments, Inc.), New Haven 8, Conn.

Code No.	Company
489	*Radio Television Products Corp., Grass Lake, Mich.
501	*Piezo Crystal Company, Carlisle, Pa.
503	Caledonia Electronics & Transformer Corp., Caledonia, N. Y.
504	*The James Knights Company, Sandwich, Ill.
505	Precision Apparatus Company, Inc., Glendale 27, Long Island, N. Y.
507	Volkert Stampings, Inc., Queens Village 29, L. I., N. Y.
508	The Hickok Electrical Instrument Co., Cleveland 8, O.
515	*Electronic Components Corporation, Chicago 8, Ill.
516	United Condenser Corporation, New York 56, N. Y.
518	*Sampson Electric Products Co., Clinton, N. C.
520	Schneider & Marquard, Inc., Newton, N. J.
524	*Triwec Transformer Company, Chicago 18, Ill.
527	Valpey Crystal Corporation, Holliston, Mass.
529	Wheeler Laboratories, Inc., Great Neck, N. Y.
530	*Clippard Instrument Laboratory, Inc., Cincinnati 39, Ohio
532	*Ward Leonard Electric Co., Mount Vernon, N. Y.
540	*Radio Industries, Inc., Des Plaines, Ill.
541	*Industrial Television, Inc., Clifton, N. J.
545	*Electronic Enterprises, Inc., Newark 4, N. J.
547	*Anaconda Wire & Cable Company, Hastings-on-Hudson 6, N. Y.
548	*B. J. Toegel, Inc., Plainfield, N. J.
549	*Mid-West Coil & Transformer Co., Chicago 14, Ill.
550	*Standard Winding Company, Newburgh, N. Y.
551	American Television & Radio Co., St. Paul 1, Minn.
552	Otis Radio & Electric Corp., Hawarden, Iowa
554	Amphenol Electronics Corporation, Chicago 50, Ill.
563	J. W. Davis & Company, Dallas 35, Texas
569	*Electrical Utilities Company, La Salle, Ill.
570	*Leonard Electric Products Co., Inc., Brooklyn 32, N. Y.
571	*General Cable Corporation, Perth Amboy, N. J.
572	*F. & V. Coil Winding Corporation, Newark 5, N. J.
573	Alcon Metal Products, Inc., Chicago 47, Ill.
574	*Stanwyck Winding Company, Newburgh, N. Y.
575	*Heppner Manufacturing Company, Round Lake, Ill.
579	Belden Manufacturing Company, Chicago 44, Ill.
580	*Rowe Industries, Toledo 9, Ohio
582	*General Precision Laboratory Inc., Pleasantville, N. Y.
586	Drake Manufacturing Company, Chicago 22, Ill.
587	Radio Specialty Manufacturing Co., Portland 14, Ore.
588	Barnes Metal Products Company, Chicago 23, Ill.
589	David Bogen Co. Division, The Siegler Corp., Paramus, N. J.
593	Kip Electronics Corporation, Stamford, Conn.
594	*Kobzy Tool Company, Chicago 22, Ill.
596	*Gramer-Halldorson Transformer Corp., Chicago 39, Ill.
599	*Elco Corporation, Philadelphia 24, Penna.
604	The Staver Company Incorporated, Bay Shore, L. I., N. Y.
606	*Woodward-Schumacher Electric Corp., Chicago 22, Ill.
607	Consolidated Wire & Associated Companies, Chicago 16, Ill.
608	*TELvision Laboratories, Inc., Wauconda, Ill.
610	Carter Parts Company, Skokie, Ill.
614	Simpson Electric Company, Chicago 44, Ill.
616	Illinois Condenser Company, Chicago 22, Ill.
617	RAM Electronics, Inc., Paramus, N. J.
620	Kay Electric Company, Pine Brook, N. J.
621	*Polan Industries, Inc., Huntington 19, W. Va.
624	Surprenant Mfg. Co., Boston 8, Mass.
628	*Davis Electric Company, Cape Girardeau, Mo.
631	*Pickering and Company, Inc., Plainview, L. I., N. Y.
632	*El-Rad Manufacturing Co., Chicago 18, Ill.
637	*Central Coil Company, Indianapolis 22, Ind.
638	Industrial Development Engineering Associates, Inc., Indianapolis 26, Ind.
642	Mycalex Corporation of America, Clifton, N. J.
643	*National Aeronautical Corporation, Fort Washington, Pa.
644	General Railway Signal Company, Rochester 2, N. Y.
647	Kimble Glass Company, Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio
648	*American Radionic Co., Inc., Danbury, Conn.
649	*Electro-Voice, Inc., Buchanan, Mich.
653	Wind Turbine Company, West Chester, Pa.
657	Lowell Manufacturing Company, St. Louis 17, Mo.
658	Sangamo Electric Company, Electronic Components Division, Springfield, Ill.
662	Weller Electric Corporation, Easton, Pa.
665	Penn Tran Corporation, Bellefonte, Penna.
668	*Standard Electrical Products Co., Dayton, 3, Ohio
670	Glaser-Steers Corporation, Newark 4, N. J.
671	*Lytle Engineering Co., Chicago 1, Ill.
672	Thomas Electronics, Inc., Passaic, N. J.
677	*Rogers Electronic Corp., New York 12, N. Y.
679	*Tech-Master Corporation, Brooklyn 1, N. Y.
680	Conrac, Incorporated, Glendora, Calif.
681	*American Lava Corporation, Chattanooga 5, Tenn.
682	*Electrical Windings, Inc., Chicago 39, Ill.
683	Wright Zimmerman, Inc., New Brighton, Minn.
684	*Sarkes Tarzian, Inc., Bloomington, Ind.
687	*Hillburn Electronic Products Co., Brooklyn 22, N. Y.
688	*Trad Electronics Corporation, Asbury Park, N. J.
689	Aladdin Electronics, a Division of Aladdin Industries, Incorporated, Nashville 10, Tenn.
692	CELCO (Constantine Engineering Laboratories Co.), Mahwah, N. J.
693	Multi-Tron Laboratory, Inc., Westchester, Ill.
694	Standard Electronics, Division of Radio Engineering Labs., Inc., Long Island City 1, N. Y.
695	Basler Electric Company, Highland, Ill.
697	*Phalo Plastics Corporation, Shrewsbury, Mass.
698	Sheffco Mfg. Corp., Fairview, N. J.
699	*Keystone Electronics Company, Newark 4, N. J.
700	*The Radion Corporation, Crystal Lake, Ill..
701	Forbes & Wagner, Inc., Silver Creek, N. Y.
703	Prodelin, Inc., Kearny, N. J.
704	Cosmic Radio Corporation, New York 59, N. Y.
705	*Ajax Condenser Co., Inc., Chicago 14, Ill.
706	Pioneer Electronics Corporation, Los Angeles 64, Calif.
710	*Standard Condenser Corp., Chicago 13, Ill.
711	*Controls Company of America, Schiller Park, Ill.
719	*Carbonneau Industries, Grand Rapids 2, Mich.
720	*Methode Manufacturing Corp., Chicago 47, Ill.
721	*Rollan Electric Co., Chicago 20, Ill.
722	Milwaukee Resistor Co., Milwaukee 4, Wis.
723	Northwest Plastics, Inc., St. Paul 7, Minn.
724	Jeffers Electronics Division, Speer Carbon Company, Dubois, Penna.
730	Jersey Specialty Co., Inc., Wayne, N. J.
732	Radio Materials Company, Div. P. R. Mallory & Co., Inc., Chicago 18, Ill.
733	Alpha Metals, Inc., Jersey City 4, N. J.
739	Oak Electronics Company, Buffalo 3, N. Y.
740	Olympic Products Co., Inc., Alpha 1, N. J.
742	*Esquire Radio Corporation, Brooklyn 19, N. Y.
743	*Quik-Chek Corporation, Philadelphia 44, Pa.
744	Hughes Aircraft Company, Culver City, Calif.
745	*Tempel Steel Company, Chicago 26, Ill.
746	*L. H. Frost & Co., Inc., Grand Rapids 8, Mich.
748	*Russell Speaker Company, Chicago 21, Ill.
749	*National Electronics, Incorporated, Geneva, Ill.
750	Mosley Electronics, Incorporated, St. Louis 14, Mo.
752	*Electronic Devices, Inc., Brooklyn 15, N. Y.
757	*Grand Transformers, Inc., Grand Haven, Mich.
758	*Whitewater Electronics Inc., Whitewater, Wis.
761	*Planet Manufacturing Corp., Bloomfield, N. J.
762	Erca Tool Die & Stamping Co., Brooklyn 22, N. Y.
767	Quincy Speaker Manufacturing Corp., Quincy, Ill.
768	*Microtran Company, Inc., Valley Stream, L. I., N. Y
770	Stone City Machine & Tool Co., Bedford, Ind.
771	Penta Laboratories, Inc., Santa Barbara, Calif.
773	*The Forest Electric Company, Forest Park, Ill.
776	*Ogden Coil & Transformer Co., Chicago 12, Ill.
780	DeJur-Amsco Corporation, Long Island City, N. Y.
781	Vacuum Tube Products Co., Inc., Oceanside, Calif.
782	*Spencer Kennedy Laboratories, Inc., Boston 35, Mass.
783	Eldico Electronics, Division of Radio Engineering Laboratories, Inc., Long Island City, N. Y.
784	Johnson Electronics Inc., Casselberry, Fla.
785	*Dresco Industries, Beverly Hills, Calif.
786	*Hinners-Galanek Radio Corp., Cavalier Radio & Television Div., Forrest Hills 74, N. Y.
787	*Sonotone Corporation, Elmsford, N. Y.
789	McGregor Electronic Industries, Inc., McGregor, Ia.
791	*Hopkins Engineering Company, San Fernando, Calif.
792	Atlantic Wire & Cable Corp., College Point 56, N. Y.
793	*McIntosh Laboratory, Inc., Binghamton, N. Y.
797	Vidaire Electronics Mfg. Corp., Baldwin, N. Y.
798	*Supreme Transformer Corporation, Chicago 39, Ill.
799	*California Magnetic Control Corp., North Hollywood, Calif.
804	*Union Electric & Manufacturing Company, Jersey City 7, N. J.
806	*Gordos Corporation, Bloomfield, N. J.
808	*Henald Manufacturing Co. Inc., Piper City, Ill.
809	Varian Associates, Palo Alto, Calif.
810	Translite Electronics Corp., Chicago 39, Ill.
811	Continental Electronics Corp., Philadelphia 32, Penna.
812	*Bradley Semiconductor Corporation, New Haven 11, Conn.
813	Adler Electronics Inc., New Rochelle, N. Y.
815	San Fernando Electric Mfg. Co., San Fernando, Calif.
816	Dale Products, Inc., Columbus, Nebr.
817	Brubaker Electronics, Inc., Culver City, Calif.
819	Z & W Mfg. Corp., Wickliffe, Ohio
820	*United Electronic Manufacturing Corp., Union City, N. J.
822	*Syntronic Instruments, Inc., Addison, Ill.
824	*Videocraft Manufacturing Co., Chicago 39, Ill.
825	*Thermador Electrical Mfg. Co., Div. of Norris-Thermador Corp., Los Angeles 22, Calif.

Code No.	Company
828	Midland Manufacturing Co., Inc., Kansas City 15, Kan.
830	Triad Transformer Corporation, Venice, Calif.
831	*Better Coil & Transformer Corp., Goodland, Ind.
832	McCoy Electronics Co., Mt. Holly Springs, Penna.
834	*Mel-Rain Corporation, Indianapolis 4, Ind.
835	*Ratel, Inc., Goleta, Calif.
836	*National Video Corporation, Chicago 32, Ill.
837	*Carol Electronics Corporation, Martinsburg, W. Va.
840	Orradio Industries, Inc., Opelika, Ala.
841	Central Electronic Manufacturers, Inc., Denville, N. J.
842	The Tetrad Company, Yonkers 2, N. Y.
845	International Rectifier Corporation, El Segundo, Calif.
848	Onondaga Pottery Company, Electronics Division, Syracuse 1, N. Y.
851	R. L. Drake Company, Miamisburg, Ohio
852	*Andrews Tower Rental, Inc., Fort Worth, Tex.
855	International Instruments Inc., West Haven, Conn.
856	Clevite Transistor Products, Waltham 54, Mass.
857	*V-M Corporation, Benton Harbor, Mich.
863	*James Vibrapowr Company, Chicago 18, Ill.
866	*Industrial Hardware Manufacturing Co., Inc., New York 12, N. Y.
867	C-B-C Electronics Co., Inc., Philadelphia 20, Pa.
868	Telechrome Mfg. Corp., Amityville, N. Y.
869	*Kline Iron and Steel Company, Columbia, S. C.
870	Cubic Corporation, San Diego 11, Calif.
871	Precision Electronics Inc., Franklin Park, Ill.
872	S & A Electronics, Toledo 5, Ohio
878	Acro Products Company, Philadelphia 28, Penna.
879	Litton Industries, Beverly Hills, Calif.
881	*Unitek Corporation, Pasadena 8, Calif.
885	M.E.C., Inc., Nashville 4, Tenn.
886	Calvideo Tube Corporation, Los Angeles 45, Calif.
887	Telemeter Magnetics, Inc., Los Angeles 64, Calif.
888	Connector Corporation, Chicago 30, Ill.
891	*Southern Electronics Company, Greeneville, Tenn.
892	*American Transformer Corp., Chicago 7, Ill.
893	Armel Electronics Inc., Brooklyn 32, N. Y.
894	Hy-Gain Antenna Products Company, Lincoln 4, Nebr.
895	*Dinion Coil Co., Inc., Caledonia, N. Y.
897	Tresco, Inc., Philadelphia 28, Penna.
898	Convair, Pomona Division, General Dynamics Corp., Pomona, Calif.
900	ACF Electronics, Division of ACF Industries, Inc., Alexandria, Va.
901	*Cargo Packers, Inc., Glendale 27, N. Y.
902	Elgin Metalformers Corporation, Elgin, Ill.
903	Electro-Products, Inc., Detroit 27, Mich.
906	*Coilcraft, Incorporated, Cary, Ill.
909	*Chester Cable Corp., Chester, N. Y.
910	*Aerolite Electronics Corp., Union City, N. J.
911	International Electronic Industries, Inc., Nashville 1, Tenn.
912	*Blackburn Electronic Corporation, Wyoming, Pa.
913	General Products Corporation, Union Springs, N. Y.
915	*Inductor Engineering, Inc., Lewes, Del.
917	Resitron Laboratories, Inc., Los Angeles 25, Calif.
918	*Oaktron Industries Inc., Monroe, Wis.
920	The Antenna Specialists Co., Cleveland 6, Ohio
921	Technical Training Institute, Portland 11, Ore.
922	Standard Television Tube Corp., New Orleans 12, La.
923	Jerrold Electronics Corporation, Philadelphia 32, Pa.
924	Radio Development & Research Corp., Paterson 3, N. J.
925	*Kin Tel, Division of Cohu Electronics, Inc., San Diego 11, Calif.
926	*Todd Electric Company, Inc., Yonkers, N. Y.
927	General Mills, Inc., Mechanical Division, Minneapolis 13, Minn.
928	*Acme Coil & Transformer Corp., Chicago 14, Ill.
929	Parker Metal Goods Company, Worcester, Mass.
931	Skiatron Electronics & Television Corp., New York 14, N. Y.
933	*Magnetic Coil Manufacturing Company, Chicago 22, Ill.
934	*Oaktron Electric Company, Tinley Park, Ill.
935	Electrons, Incorporated, Newark 3, N. J.
936	*Hamilton-Hall Resistor Corp., Milwaukee 2, Wis.
938	ITT Federal Division, Fort Wayne, Ind.
940	Bomac Laboratories, Inc., Beverly, Mass.
941	*Electronic Engineering Company of California, Santa Ana, Calif.
943	*Datex Corporation, Monrovia, Calif.
945	*J & G Machine Co., Inc., Worcester 8, Mass.
947	Pacific Semiconductors, Inc., Culver City, Calif.
949	*Apex Coil and Transformer Corporation, Chicago 8, Ill.
951	Kost Products Company, Inc., Chicago 39, Ill.
952	Rhein Sound Systems, Inc., New Haven 5, Conn.
953	Scientific Radio Products, Inc., Loveland, Colo.
954	Union City Filament Corp., Union City, N. J.
956	Vitramon, Inc., Bridgeport 1, Conn.
957	Winston Electronics, Inc., Philadelphia 27, Pa.
959	*Transitron Electronic Corporation, Wakefield, Mass.
960	*Ontario Industries, Inc., Hornell, N. Y.
961	Anton Electronics Laboratories, Inc., Sub. U. S. Hoffman Machinery Corp., Brooklyn 37, N. Y.
963	Foto-Video Laboratories, Inc., Cedar Grove, N. J.
964	Huggins Laboratories, Inc., Sunnyvale, Calif.
965	Moloney Electric Company, St. Louis 20, Mo.
966	Mullenbach Division of Electric Machinery Mfg. Co., Los Angeles 58, Calif.
967	North American Aviation, Inc., Los Angeles 45, Calif.
968	Rapid Die and Molding Co., Schiller Park, Ill.
971	Vector Electronic Company, Glendale, Calif.
972	*Industrial Tubes, Inc., Geneva, Ill.
973	*PCA Electronics Inc., Sepulveda, Calif.
974	*Lectrohm, Inc., Chicago 30, Ill.
975	*Sherold Crystals Inc., Kansas City 8, Mo.
976	*Model Engineering & Manufacturing, Inc., Chicago 18, Ill.
977	*Filtors, Inc., Port Washington, L. I., N. Y.
978	American Electronics Company, New York 59, N. Y.
979	Ratigan Electronics Inc., Glendale 4, Calif.
980	Texas Instruments Incorporated, Dallas 9, Tex.
982	*Precision Electronic Coil Manufacturing Company, Santa Monica, Calif.
983	*Gonset Division, Young Spring & Wire Corp., Burbank, Calif.
984	*Electro-Winders Co., Inc., Covina, Calif.
985	*Bartlett Manufacturing Company, Glenview, Ill.
987	*Florida-Merit Inc., Hollywood, Fla.
988	Tansitor Electronics, Inc., Bennington, Vt.
989	*Marvel Electric Corporation, Chicago 22, Ill.
990	General Transistor Corporation, Jamaica 35, N. Y.
992	Grayhill, La Grange, Ill.
993	Midwest Speaker Company, McGregor, Iowa
994	Eberline Instrument Corporation, Santa Fe, N. M.
995	Standard Crystal Company, Kansas City 8, Mo.
996	*Grand Coil Winders, Grand Haven, Mich.
997	*United States Dynamics Corporation, Boston 20, Mass.
999	*National Tel-Tronics Corp., Yonkers, N. Y.
1000	Switchcraft, Inc., Chicago 30, Ill.
1002	*The Amplifone Corporation, Chicago 40, Ill.
1003	*Fugle-Miller Laboratories, Clark, N. J.
1004	*Jet Electronics Corporation, Glendale 4, Calif.
1005	*Quality Transformer & Coil Co., Inc., Chicago 14, Ill.
1006	*Fischer Electric Co., Inc., De Leon Springs, Fla.
1007	Hycon Mfg. Company, Pasadena, Calif.
1011	*Park Products Company, Cleveland 3, Ohio
1012	Red Bank Division, Bendix Aviation Corp., Long Branch, N. J.
1013	*Ion Capacitor Corp., Columbia City, Ind.
1014	*Burnell & Co., Inc., Pelham Manor, N. Y.
1016	*Kemtron Electron Products, Inc., Newburyport, Mass.
1017	Campbell Industries, Inc., Sub., Clarostat Mfg. Co., Dover, N. H.
1019	Communication Accessories Company, Sub., Collins Radio Co., Lee's Summit, Mo.
1022	International Electronics Corp., New York 12, N. Y.
1023	International Electronic Research Corp., Burbank, Calif.
1024	Leach Corporation, Compton, Calif.
1025	*Torwico Electronics, Inc., Union, N. J.
1026	Soundolier, Inc., St. Louis 22, Mo.
1027	Presto Recording Company, Div., The Siegler Corp., Paramus, N. J.
1028	*Gray & Kuhn, Inc., Roslyn Heights, N. Y.
1030	*NYT Electronics, Inc., Burbank, Calif.
1031	*A.L.A. Industries, Inc., Harrison, N. Y.
1033	*Electro Engineering Works, San Leandro, Calif.
1035	*Associated Transformer Corp., Chicago 47, Ill.
1036	*Utrad Corporation, Huntington, Ind.
1038	*Holiday Transformer Corporation, Chicago 14, Ill.
1039	Cal-Ros Industries, Inc., Chicago 22, Ill.
1040	Ferranti Electric, Inc., Brooklyn 1, N. Y.
1041	*Mayfair Molded Products Corporation, Schiller Park, Ill.
1042	Rheem Manufacturing Co., Defense & Technical Products Div., Downey, Calif.
1044	*Bradford Components, Inc., Salamanca, N. Y.
1045	Gremar Manufacturing Co., Inc., Wakefield, Mass.
1046	*Dunleavey Electronics Corporation, Stoughton, Mass.
1048	*Columbia Technical Corporation, Woodside 77, N. Y.
1049	*Wirco Electronics, Inc., El Monte, Calif.
1050	Pomona Electronics Co., Inc., Pomona, Calif.
1051	Audio Devices, Inc., Rectifier Division, Santa Ana, Calif.
1052	*Transformer Manufacturers, Inc., Chicago 30, Ill.
1053	Industro Transistor Corporation, Long Island City 6, N. Y.
1054	Kentron Hawaii Ltd., Honolulu 14, Hawaii
1055	*Rogers Corporation, Rogers, Conn.
1056	*Gefco Manufacturing Company, Grayslake, Ill.
1057	*Gahagan, Inc., Esmond 17, R. I.
1058	Entron Incorporated, Bladensburg, Md.
1059	*Channel Master Corporation, Ellenville, N. Y.

Code No.	Company
1060	*Schwalm Electronics, Inc., Highland Park, Ill.
1061	*Sun Capacitors, Chicago 25, Ill.
1062	*Advanced Research Associates, Inc., Kensington, Md.
1063	Philco Corporation, Accessory Division, Philadelphia, Pa.
1064	Chemtronic Corporation, Nashville 4, Tenn.
1065	Temco Aircraft Corporation, Dallas 22, Tex.
1066	*South Haven Coil, Inc., South Haven, Mich.
1067	*Wesco Electrical and Manufacturing Company, Greenfield, Mass.
1068	Callins Industries, Inc., Greenfield, Tenn.
1069	*ESC Corporation, Palisades Park, N. J.
1070	*Paul Smith, Inc., Cincinnati 9, Ohio
1071	*Caddell-Burns Mfg. Co. Inc., Mineola, N. Y.
1072	*Hermetic Seal Transformer Co., Div. of S.I.E., Garland, Tex.
1073	*Underwood Electric & Mfg. Co., Inc., Chicago 39, Ill.
1074	*Wells Electronics Company, South Bend 23, Ind.
1075	*Metals & Controls Corporation, Attleboro, Mass.
1076	*Horton and Hubbard Manufacturing Co., Nashua, N. H.
1077	*Standard Electromagnetics Inc., Frederick, Md.
1078	*Lumen, Inc., Joliet, Ill.
1079	Nortronics, A Div. of Northrop Aircraft, Inc., Hawthorne, Calif.
1080	SNC Manufacturing Co., Inc., Oshkosh, Wis.
1081	Syncro Corporation, Electronics Div., Hicksville, Ohio
1082	*Winchester Electronics, Inc., Norwalk, Conn.
1083	*Melrose Products, Inc., Willow Grove, Pa.
1084	*Transcon Manufacturing Co., Dallas 9, Tex.
1085	*Tritron Company, Milwaukee 12, Wis.
1086	*Pacific Mercury Electronics, Sepulveda, Calif.
1087	Minneapolis-Honeywell Regulator Co., Semiconductor Products Div., Minneapolis 8, Minn.

EIA WEEKLY DATE CODE

SYMBOL OF EACH WEEK IN PERIOD OF DECEMBER 28, 1958 TO JANUARY 2, 1960

Code	Period					
01	Dec. (1958)	28	to	Jan. (1959)	3	Inc.
02	January	4	to	January	10	"
03	January	11	to	January	17	"
04	January	18	to	January	24	"
05	January	25	to	January	31	"
06	February	1	to	February	7	"
07	February	8	to	February	14	"
08	February	15	to	February	21	"
09	February	22	to	February	28	"
10	March	1	to	March	7	"
11	March	8	to	March	14	"
12	March	15	to	March	21	"
13	March	22	to	March	28	"
14	March	29	to	April	4	"
15	April	5	to	April	11	"
16	April	12	to	April	18	"
17	April	19	to	April	25	"
18	April	26	to	May	2	"
19	May	3	to	May	9	"
20	May	10	to	May	16	"
21	May	17	to	May	23	"
22	May	24	to	May	30	"
23	May	31	to	June	6	"
24	June	7	to	June	13	"
25	June	14	to	June	20	"
26	June	21	to	June	27	"
27	June	28	to	July	4	"
28	July	5	to	July	11	"
29	July	12	to	July	18	"
30	July	19	to	July	25	"
31	July	26	to	August	1	"
32	August	2	to	August	8	"
33	August	9	to	August	15	"
34	August	16	to	August	22	"
35	August	23	to	August	29	"
36	August	30	to	September	5	"
37	September	6	to	September	12	"
38	September	13	to	September	19	"
39	September	20	to	September	26	"
40	September	27	to	October	3	"
41	October	4	to	October	10	"
42	October	11	to	October	17	"
43	October	18	to	October	24	"
44	October	25	to	October	31	"
45	November	1	to	November	7	"
46	November	8	to	November	14	"
47	November	15	to	November	21	"
48	November	22	to	November	28	"
49	November	29	to	December	5	"
50	December	6	to	December	12	"
51	December	13	to	December	19	"
52	December	20	to	December	26	"
53	December	27	to	Jan. (1960)	2	"

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MAGNAVOX CHASSIS V-30-01AA thru V30-12AA (30 Series)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MAGNAVOX CHASSIS V-30-01AA
thru V30-12AA (30 Series)

MAGNAVOX CHASSIS V-30-01AA
thru V30-12AA (30 Series)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

MAGNAVOX CHASSIS V-30-01AA thru V30-12AA (30 Series)

TRADE NAME	Magnavox	TV CHASSIS V30-01AA, 02AA*, 03AA †, 04AA*, 05AA, 06AA*, 07AA*, 08AA†, 09AA, 10AA, 11AA, 12AA, POWER TUNING 700769-2, -5, REMOTE CONTROL 700742-1, 700781, 700782
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana	
TYPE SET	Television Receiver with Power Tuning and Wired Remote Control	
TUBES	Twenty	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING TV (only) 210 Watts, 1.85 Amp. @ 117 Volts AC With Power Tuning 212 Watts, 1.9 Amp. @ 117 Volts AC (2 Watts, .5 Amp. when OFF) While Tuning 240 Watts, 2.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

* USES AMPLIFIER CHASSIS AMP-169. FOR SERVICE INFORMATION SEE PHOTOFACT SET 404 FOLDER 8.
† USES FM-AM TUNER CHASSIS 57-02-00. FOR SERVICE INFORMATION SEE PHOTOFACT SET 346 FOLDER 13.

SERVICING IN THE FIELD

LINE VOLTAGE ADJUSTMENT

A socket (with shorting plug) is located directly above the fuse holder to vary the operation from 117 volt line or higher line voltage. See schematic on page 2.

FUSE

One fuse is used for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)
One fuse is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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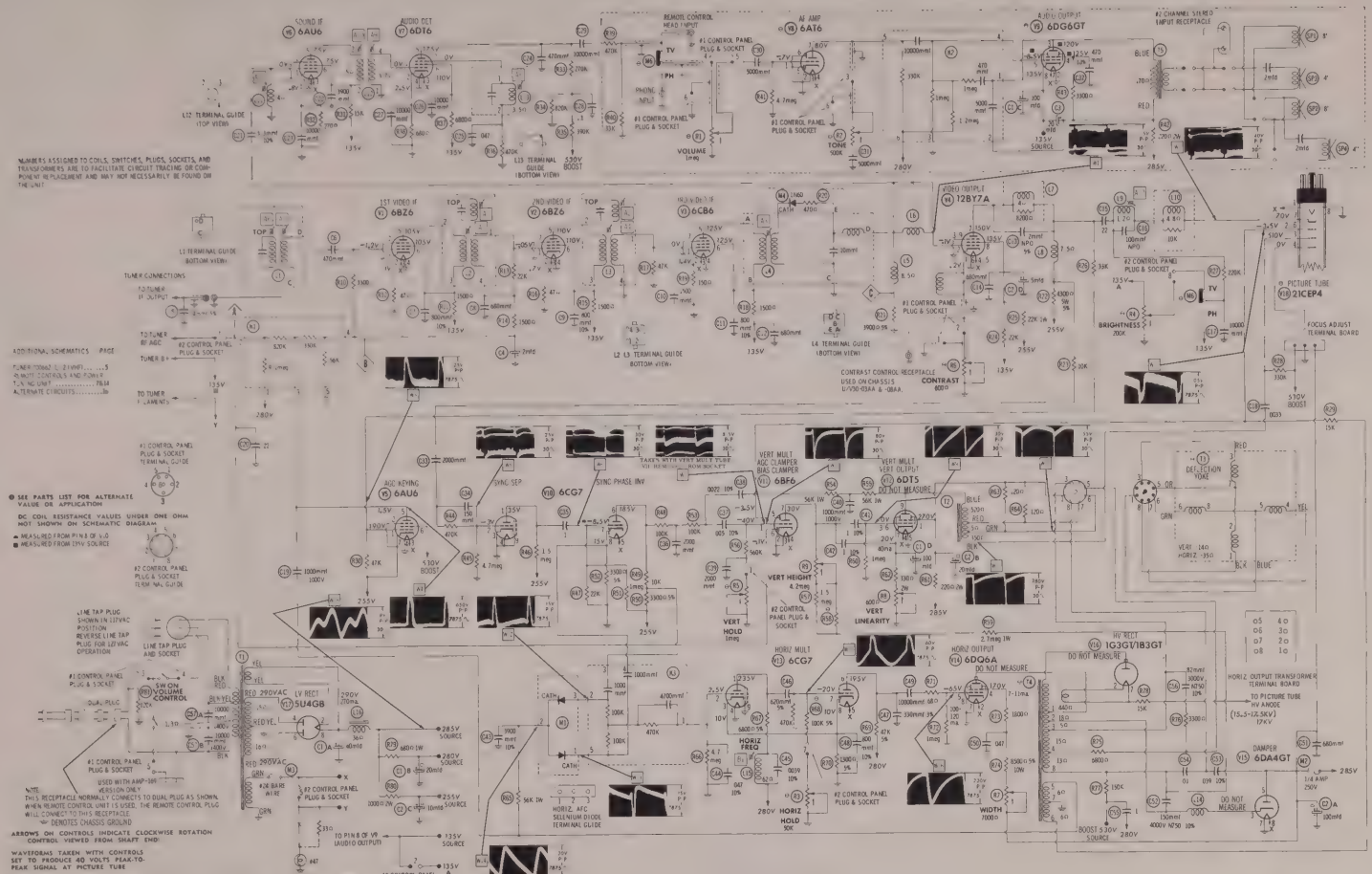
MAGNAVOX CHASSIS V-30-01AA thru V30-12AA (30 Series)

MAGNAVOX CHASSIS V-30-01AA thru V30-12AA (30 Series)

SET 446 FOLDER 1


SOUND IF 6AU6
AUDIO DET 6DT6
AF AMP 6AT6
AUDIO OUTPUT 6DG6GT
#1 CHANNEL STEREO INPUT RECEPTACLE
1ST VIDEO IF 6BZ6
2ND VIDEO IF 6BZ6
VIDEO DET 6CB6
VIDEO OUTPUT 12BY7A
PICTURE TUBE 21CEP4
AGC &DKHYG 6AU6
SYNC SEP
6CG7
SYNC PHASE INV
VERT MULT AGC CLAMPER BIAS CLAMPER 6BF6
VERT MULT VERT OUTPUT 6DT5
DEFLECTION YOKE
VERT HOLD
VERT HEIGHT
VERT LINEARITY
HORIZ MULT 6CG7
HORIZ FREQ
HORIZ HOLD
HORIZ OUTPUT 6DQ6A
HV RECT 1G3GT/1B3GT
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
TO PICTURE TUBE HV ANODE
(15.5-17.5KV)
DAMPER 6DA4GT
WIDTH
LINE TAP PLUG AND SOCKET
SW ON VOLUME CONTROL
LV RECT 5U4GB
DUAL PLUG
#1 CONTROL PANEL PLUG & SOCKET
#2 CONTROL PANEL PLUG & SOCKET
#2B BARE WIRE
TUNER CONNECTIONS
TO TUNER I.F. OUTPUT
TO TUNER AGC
TO TUNER B+
TO TUNER F. LAMENTS
ADDITIONAL SCHEMATICS PAGE
#1 CONTROL PANEL PLUG & SOCKET TERMINAL GUIDE
#2 CONTROL PANEL PLUG & SOCKET TERMINAL GUIDE
L1 TERMINAL GUIDE BOTTOM VIEW
L2 TERMINAL GUIDE TOP VIEW
L3 TERMINAL GUIDE BOTTOM VIEW
L4 TERMINAL GUIDE BOTTOM VIEW
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
REMOTE CONTROL HEAD INPUT
VOLUME (PM)
TONE
BRIGHTNESS
CONTRAST
FOCUS ADJUST TERMINAL BOARD
BOOST 530V SOURCE
285V SOURCE
280V SOURCE
255V SOURCE
135V SOURCE
TO PIN 8 OF V9 (AUDIO OUTPUT)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
MEASURED FROM PIN 8 OF V.O.
MEASURED FROM 135V SOURCE
LINE TAP PLUG SHOWN IN 117VAC POSITION REVERSE LINE TAP PLUG FOR 187VAC OPERATION
USED WITH AMP-180 VERSION ONLY
THIS RECEPTACLE NORMALLY CONNECTS TO DUAL PLUG AS SHOWN. WHEN REMOTE CONTROL UNIT IS USED, THE REMOTE CONTROL PLUG WILL CONNECT TO THIS RECEPTACLE.
DENOTES CHASSIS GROUND
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 40 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
Pin numbers are counted in clockwise direction in custom of socket
Measured values are from socket pin to common negative point unless otherwise stated
Line Voltage maintained at 117 volts for voltage readings
All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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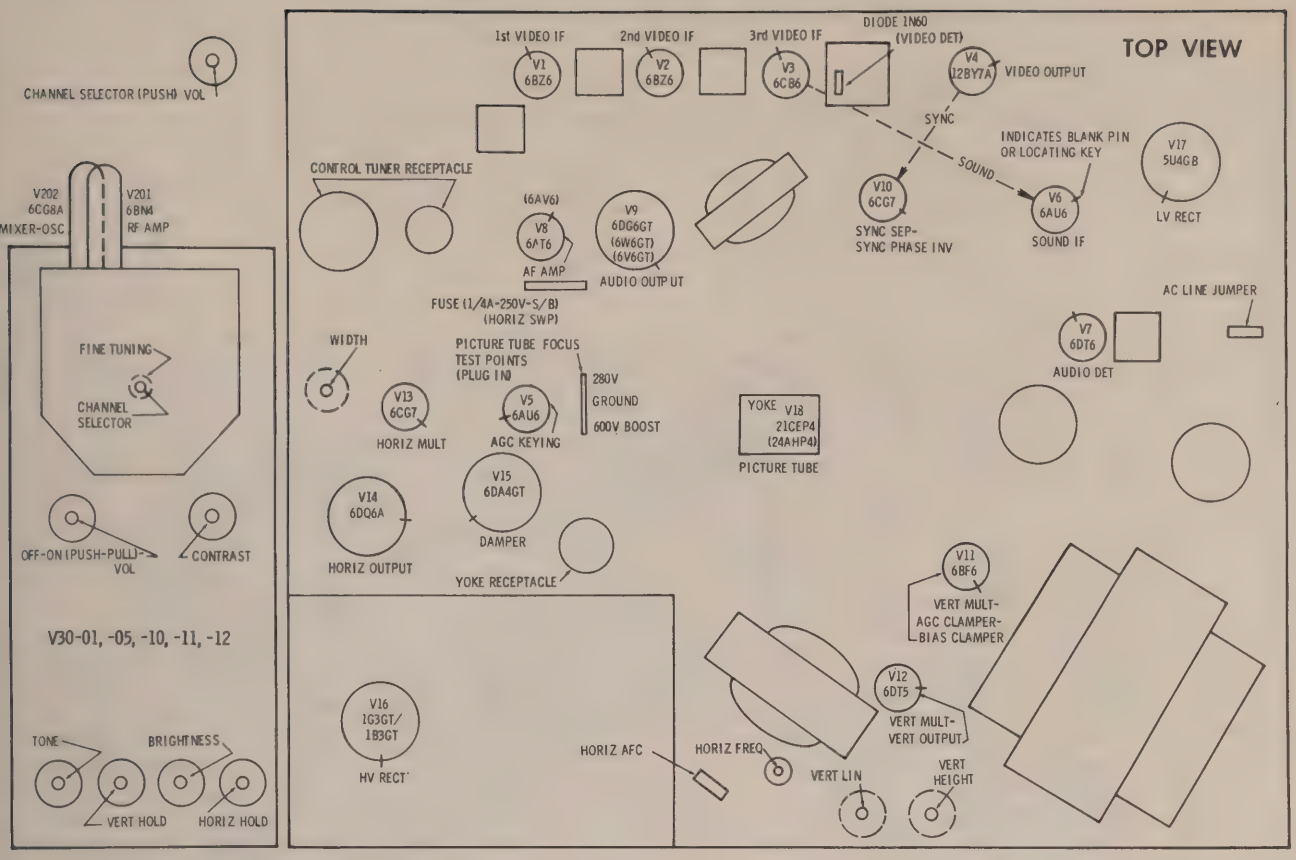
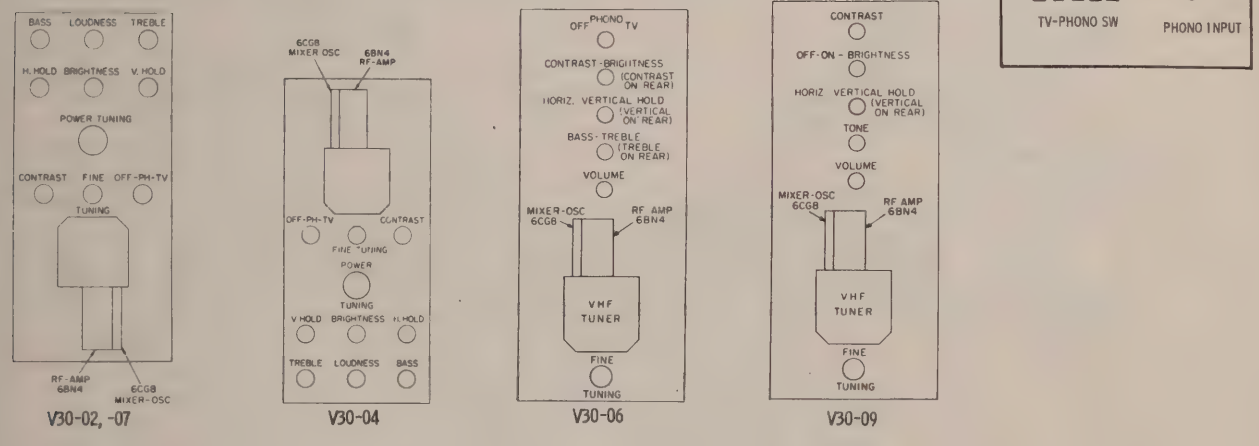
MAGNAVOX CHASSIS V-30-01AA thru V30-12AA (30 Series)

TUBE PLACEMENT CHART



CONTROL PANEL LAYOUTS



TUBE FAILURE CHECK CHART

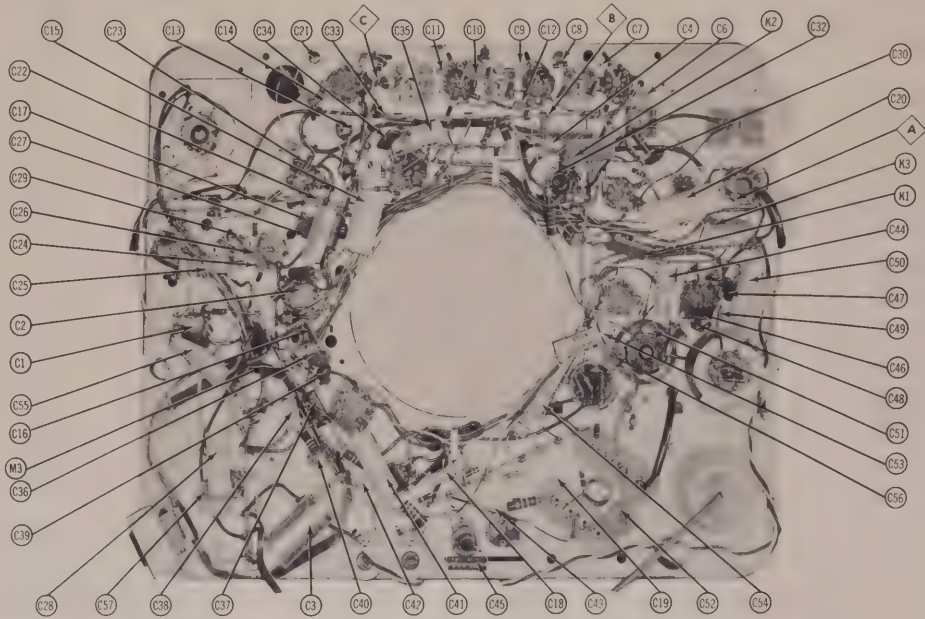
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wire, V17

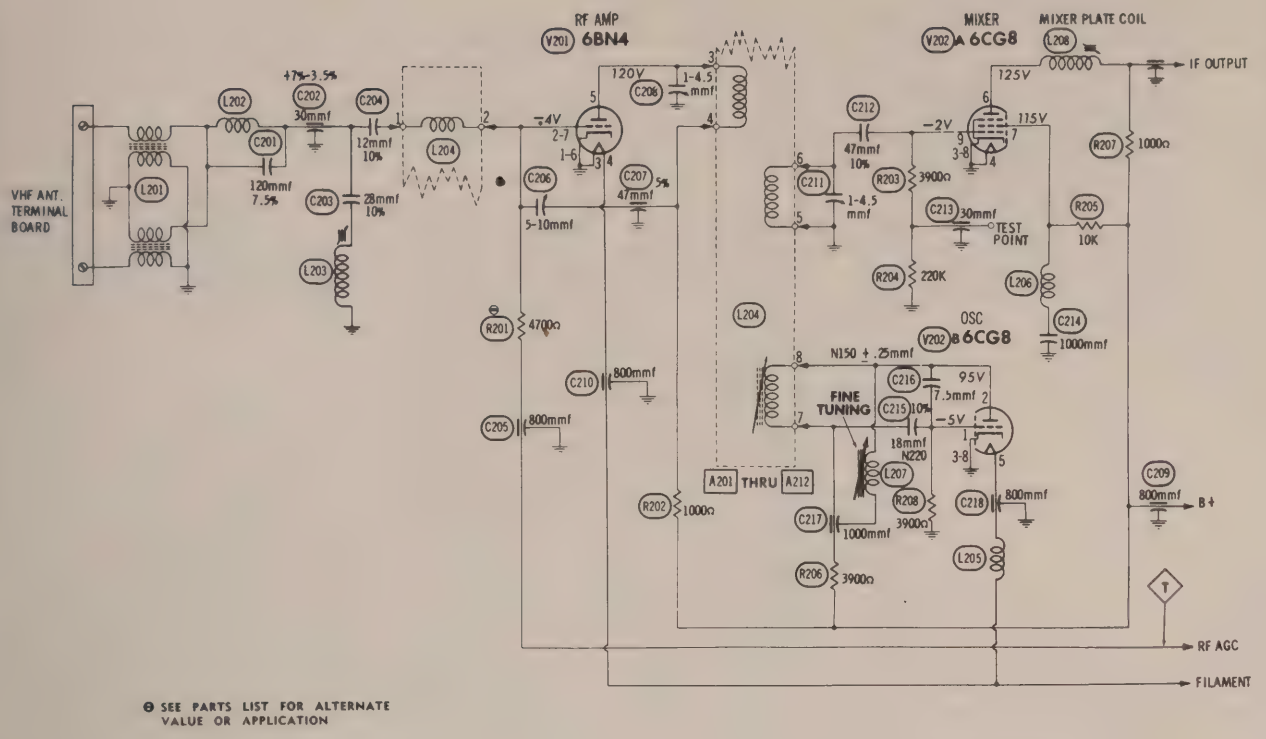
SWEEP FAILURE
No raster, has sound Rect. (Horiz. AFC), V13, V14, Fuse (1/4A), V15, V16, V18, V17
No vertical deflection V11, V12
Poor vert. linearity or foldover V11, V12
Poor horiz. linearity or foldover V13, V14, V15
Narrow picture V13, V14, V15, V17
Vert. off freq. V11, V12
Horiz. off freq. V13

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V9
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V18
Has pic, no sound V6, V7, V8, V9
Overloaded picture V5

SYNC FAILURE
No vert. sync V10
No horiz. sync V10, Rect. (Horiz. AFC)
No vert. or horiz. sync V10



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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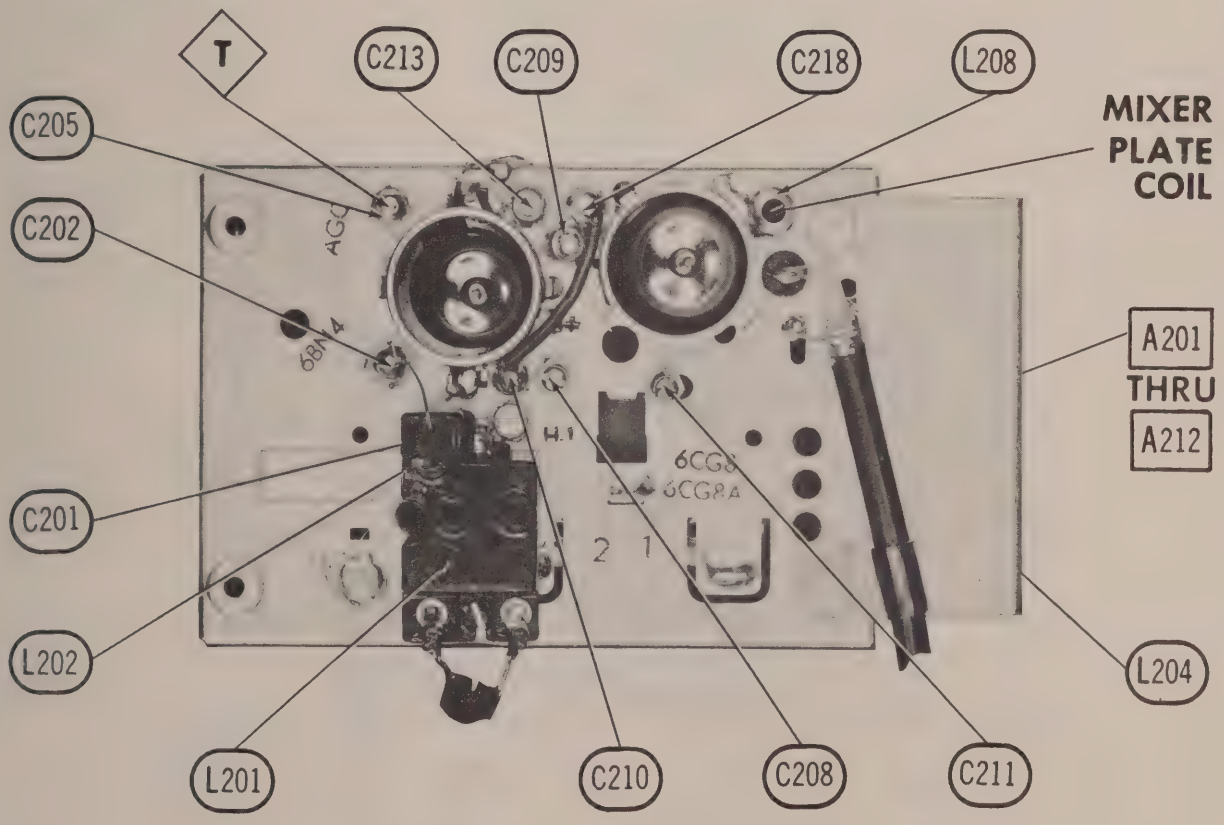
VHF TUNER 700662-1, -2



TUNER 700662-1 TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point ⊕. Positive to chassis.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A202	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A203	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A204	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A205	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A206	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A207	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A208	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A209	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A210	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A211	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER

This protion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

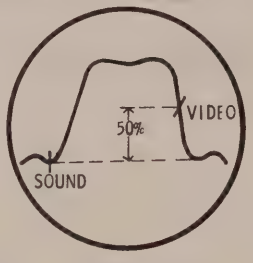
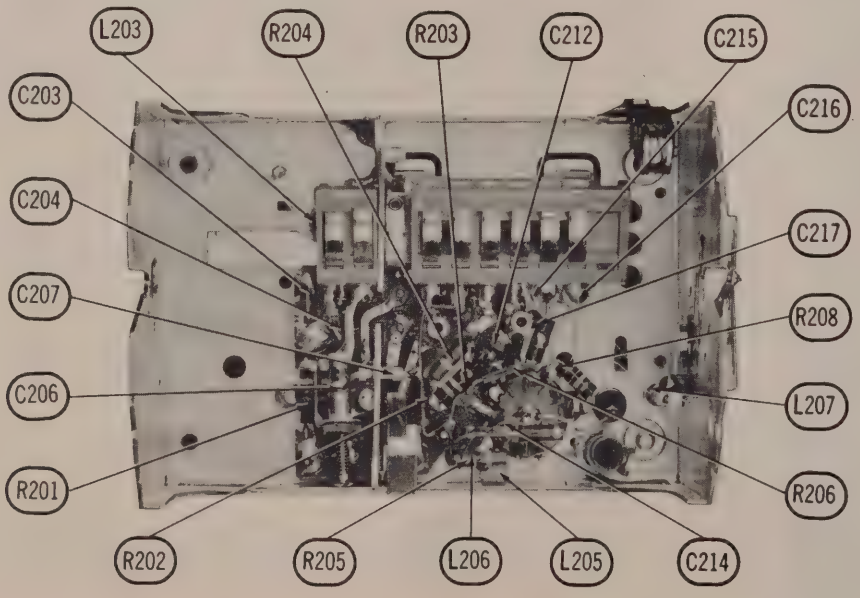
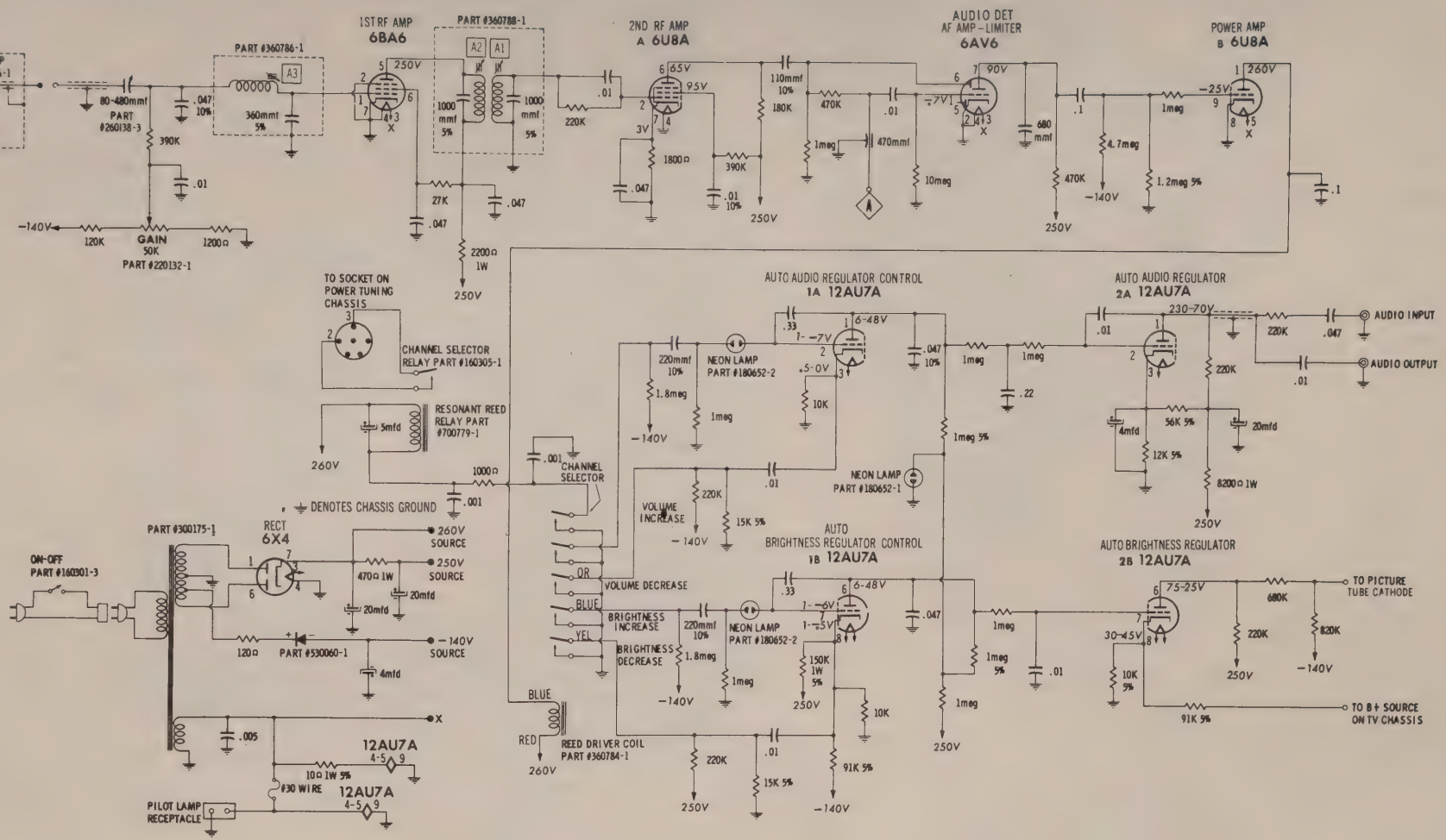


FIG. 201



TUNER 700662-1 BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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REMOTE CONTROL RECEIVER 700781

MAGNAVOX CHASSIS V30-01AA thru V30-12AA (30 Series)

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A12 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519
Mixer Plate Coil. GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (A). Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Detune Mixer Plate Coil by turning core fully counterclockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 1st Video IF. Low side to chassis.	43.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (C). Low side to chassis. (Across Video Det. load)	A1, A2	Adjust to place marker in trap notch as in Fig. 1. If two points are found to do this, use the one with the slugs farthest out of coils.
2.	"	"	"	42.25MC	"	"	A3, A4, A5	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust A3 for maximum gain, A4 to place 45.75MC marker at 50% on curve and A5 to place 42.25MC marker at 50% on other side. Recheck 47.25MC trap.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC	"	"	A6	Adjust to place 41.25MC marker in trap notch. If two points are found to do this, use the one with the slug farthest out.
4.	"	"	"	41.25MC 42.25MC 45.0MC 45.75MC	"	"	Mixer Plate Coil & A7	Adjust Mixer Plate Coil for maximum gain with 45.75MC marker at 50% as in Fig. 2. Adjust A7 for maximum gain and proper tilt. Repeat as necessary to obtain desired response. Recheck 41.25MC trap.

SOUND IF ALIGNMENT

Preset A8 for MINIMUM inductance.
Tune in a strong TV signal (preferably a tone signal or music). Adjust A8 just past the point of maximum sound with MINIMUM distortion.
Reduce the signal level by disconnecting the antenna leads or placing an adjustable attenuator pad across the terminals so that with the Volume set near maximum, sound is at a low level. Tune the Fine Tuning thru undistorted sound. Set the Fine Tuning at the verge of distortion.
Adjust A9, A10 and A11 for MINIMUM distortion.
Readjust the Fine Tuning as necessary during adjustment of A9, A10 and A11 to maintain the conditions described above.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Fine Tuning slowly clockwise until 4.5MC beat interference becomes visible in the picture. Adjust A12 until the horizontal scanning lines are smooth and continuous.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6
REMOTE ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 13

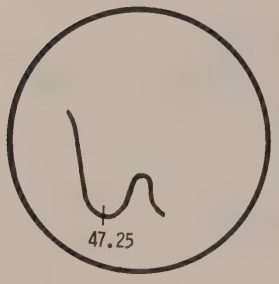


FIG. 1

FIG. 2

R1
R6
R2
R3
R4
R5
C31

TOP BOT
A6 A7
L2
TOP BOT
A1 A5
TOP BOT
A2 A4
M4
A3
R20
L4
A11
TOP BOT
A9 A10
L12
L1
M2
L3
T5
T4
C2
T2
B1
A12
L13
A8
T1
C1
M1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp	6BZ6	
V3	3rd Video IF Amp	6CB6	
V4	Video Output	12BY7A	
V5	AGC Keying	6AL5	
V6	Sound IF Amp	6AL5	
V7	Audio Det	6DT6	
V8	AF Amp	6AT6	6AV6 *
V9	Audio Output	6K6GT	6V6GT or 6V6GT

ITEM No	USE	TYPE	NOTES
V10	Sync Sep - Sync Phase Inv	6CG7	
V11	Vert Mult - AGC Clamper - Bias Clamper	6BH6	
V12	Vert Mult Vert Output	6U75	
V13	Horiz Mult	6CG7	
V14	Horiz Output	6DQ6A	
V15	Damper	6DA4GT	
V16	HV Rect	1B3GT	
V17	LV Rect	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	MAGNAVOX PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V18	21CEP4 24ABP4	24ABP4 ①	21CEP4 ② 24ABP4 ②	21CEP4 ③ 24ABP4 ③	1 Aluminized Silverama ④ 2 Silver screen 85

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	MAGNAVOX PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SPRAGUE PART No	
C1A	40	350	270021-73	AFH4-120-10	D0995	FP453 TC55	TMQ-168 YTD-20-350	TVLS-4808 § *	
B	20	350							
C	40/20	200							
D	100	30							
C2A	40/20	350	270021-72	AFH4-07	D0044	FP389-1 TC50		TVLS-4635 § *	
B	20	350							
C	40/20	350							
D	5	350							
C3	20	350	270027-20	PRS450Y20	BB2035	TC55	TD-20-350	TVA-1908	
C4	3	50	270017-33	PRS50Y3	BB53-50	TC201	TD-3-50	TVA-1301	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors.

ITEM No	RATING			REPLACEMENT DATA						NOTES
	CAP	VOLT	TOL	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	24		5%	250224-315	469-000024	TCZ-24	22R5Q24		MS-424	
C6	470			250218-6	BPD-00047	DD-471	BYA10T47	B-347	SCA-T47	
C7	500		10%	250218-14	DI-500				SCA-T50 10% *	
C8	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	SCA-T68	
C9	800		10%	250218-16	DI-800				SCA-T80 10% *	
C10	1500			250218-18	BPD-0015	DD-152	BYA10D15	B-215	SHK-G15	
C11	300		10%	250218-12	DI-300				SCA-T30 10% *	
C12	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	SCA-T68	
C13	2		NPO 5%	250175-60	NPO-2I 2		CDV30		57CCB-V2S 5% *	
C14	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	SCA-T68	
C15	22		400	250211-15	P488N-22		CUB4P22	GEM-4022	47M-P22	
C16	100		NPO	250175-58	NPO-2I 100	DTZ-100	CDV30	CNO-310	57CC-P1	
C17	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C18	.0033		800	250221-4	P488N-0033	DD-332	CUB5G33	GEM-4333	47M-D33	
C19	1000		1000	250218-31	BYD-45-1000	DD-108	BYA10DM1	B-310	SHK-DI	
C20	.22		200	250202-13	P488N-22		CUB2P22	GEM-2022	47M-P22	
C21	3.3		10%	250218-21	NPO-DI 3	TCZ-3R3	CDV13C	CNO-333	57CCB-V33S 10% *	
C22	3900			250175-31	BPD-004	DD-392	BYA10D4	B-340	SCA-D39	
C23	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C24	470			250218-6	BPD-00047	DD-471	BYA10T47	B-347	SCA-T47	
C25	.047		200	250202-11	P288N-047	DF-503	CUB2M47	GEM-2147	47M-S47	
C26	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C27	30000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C28	.047		600	250211-12	P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C29	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C30	5000			250175-30	BPD-005	DD-502	BYA10D5	B-350	SHK-D5	
C31	5000			250175-30	BPD-005	DD-502	BYA10D5	B-350	SHK-D5	
C32	470		10%	250218-6	DI-470	DE-471		JL-347	SCA-T47B 10% *	
C33	3000			250218-20	BPD-002	DD-302	BYA10D2	B-330	SHK-D3	
C34	150			250220-634	BPD-00015	DD-151	ZZR5T15	MC-336	MS-315	
C35	.1		400	250211-13	P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C36	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	SHK-D2	
C37	000		600	250217-119			PME05	JL-250	67M-I5	
C38	.022		600	250190-8			PME022	GTM-6222	67M-D22	
C39	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	SHK-D2	
C40	000	1000		250218-31	BYD-15-1000	DD-102	BYA10DM	B-210	SHK-BI	
C41	.1		600	250212-6			PM4P1	GTM-401	47M-P1	
C42	.1		600	250213-6			PM4P1	GTM-401	47M-P1	
C43	3900		10%	250218-23			PME5J4	JL-339	67M-D39	
C44	.047		200	250213-5			PM2547	GTM-2147	47M-S47	
C45	.0039		300	250194-113			PME04	GTM-234	67M-S39	
C46	630		5%	250229-349	1469-00063				MS-362	
C47	330		5%	250229-343					MS-3338 5% *	
C48	330		10%	250218-14	DI-300				SCA-T33 10% *	
C49	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	SHK-I1	
C50	.047	400		250211-12	P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C51	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	SCA-T68	
C52	150		6000	250175-58						
C53	039	600	10%	250290-3	P84CM-039		PME84	GTM-514	67M-S39	
C54	.01	600		250202-4						
C55	.1	600		250211-13	P488N-1	DD-104	CUB4P1	GEM-401	47M-P1	
C56	52	3000	N750 10%	250175-70						
C57A	10000	1400		250219-3	DAC-27	DD-103	HVE16S	2HV-110	30HKB-SI	
B	10000	1400			DAC-27	DD-103	HVE16S	2HV-110	30HKB-SI	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Imeg		220135-1				EP18A	Volume, Note 1
B	Switch						Not Req	Push-Pull Off-On
R2	500K		220146-13	B-50	B47-500K-Z	Q33-133	TA55A	Tone, Note 2
R3	50K		220146-9	BX-31	B47-50K-S	Q31-133	PTA54L	Horiz. Hold, Note 3
R4	500K		220146-10	BX-46	B47-500K-S	Q31-139	D43	Brightness, Note 4
R5	Imeg		220146-14	BX-69	B47-1meg-S	Q31-137	PTA1354L	Vert. Hold, Note 3
R6A	500Ω		220135-71	B-415	A47-750-S	Q3	D3	Contrast, Note 5
B	Shaft			Not Req.	PB-3	Not Req.	Not Req.	
R7	7000Ω		220146-15	B-43	B47-10K-S	Q31-115	TA46L	Width
R8	500Ω		220146-13	B-4	B47-750-S	Q31-105	PTA82L	Vert. Lin.
R9	4.2meg		220146-16	B-86	B47-5meg-S	Q31-141	PTA86L	Vert. Height

Note 1. Ch. V30-09 uses Imeg Volume (Part #220135-74). Ch. V30-03, 04, 07 use 3.3meg Loudness (Part #220131-14)
Ch. V30-06 use 3.3meg Volume (Part #220131-7). Ch. V30-03, 08 use alternate amplifier with a 500K Tone.

Note 2. Some versions of Ch. V30-01, 05, 10, 11, 13 may use 500K Tone (Alternate Part #220133-4).
Ch. V30-09 uses 500K Tone (Part #220135-13).
Ch. V30-03, 04, 07 use 1meg Treble, (Part #220133-20), and 3 meg Base (Part #220133-19).
Ch. V30-06 use 1meg Treble, 3meg Bass, dual, (Part #220149-7).
Ch. V30-02, 08 use alternate amplifier with a 500K Tone.

Note 3. Ch. V30-08, 09 use 50K Horiz. Hold, 1meg Vert. Hold, dual,(Part #220149-5).

Note 4. Ch. V30-03, 06 use 300K Brightness with switch (Part #220135-7).
Ch. V30-06 use 200K Brightness, 600Ω Contrast, dual, (Part #220149-8).
Ch. V30-09 use 200K Brightness, with switch (Part #220135-8).

Note 5. Ch. V30-06 use 200K Brightness, 600Ω Contrast, dual (Part #220149-8).
Ch. V30-09 use 600Ω Contrast (Part #220135-73).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R10	33000		220144-88	
R11	15000		220144-64	
R12	470		220144-46	
R13	22K		220144-78	
R14	15000		220144-64	
R15	15000		220144-64	
R16	470		220144-46	
R17	47K		220144-22	
R18	18000		220144-64	
R19	1800		220144-52	
R20	4700			
R21	13800 5%		220094 -172	
R22	43000 5%	5	240078-22	
R23	10K		220144-78	
R24	22K		220144-78	
R25	33K	1	220144-80	
R26	33K		220144-80	
R27	220K		220144-80	
R28	330K		220144-82	
R29	15K		220144-76	
R30	47K		220144-82	
R31	15K		220144-76	
R32	270Ω		220152-11	
R33	270K		220144-54	
R34	820K		220144-97	
R35	390K		220144-93	
R36	470K		220144-94	
R37	68000		220144-72	
R38	680Ω		220144-60	
R39	470K		220144-90	
R40	33K		220144-78	
R41	4.7meg		220144-105	
R42	330Ω	2	220108-54	
R43	33000		220144-88	
R44	470K		220144-94	
R45	4.7meg		220144-105	

ITEM No	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R46	1.5meg		220144-100	
R47	33K		220144-78	
R48	100K		220144-86	
R49	10K		220144-74	
R50	32000 5%			
R51	1meg		220144-98	
R52	33000 5%			
R53	100K		220144-86	
R54	56K	1	220144-85	
R55	56K	1		
R56	560K		220144-96	
R57	1.5meg		220144-100	
R58			220130-3	Note 1
R59	3.7meg	1	220144-104	
R60	1meg		220144-98	
R61	2200	2	220105-54	
R62	3300	2	220105-56	
R63	1200		220104-51	
R64	56K	1	220144-85	
R65	56K	1	220105-82	
R66	4.7meg		220144-106	
R67	68000 5%		220094-179	
R69	100K 5%		220094-207	Note 2
R68	47K 5%		220094-189	
R70	12000 5%		220094-182	
R71	68Ω		220104 -43	
R72	1meg		220144-98	
R73	18000		220144-65	
R74	85000 5%	10	240078-21	
R75	68000		220104-72	
R76	33000		220144-88	
R77	150K		220144-88	
R78	15K		220144-76	
R79	680	1	220105-60	
R80	1000	2	220105-62	
R81	1200			Note 3

Note 1. Temperature compensating. Approximately 700K Cold.
Note 2 Some versions may use 62K in this application

Note 3. Some versions may use 150K in this application

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	AGC Coupler	56K, 330K, 820K, 9.1meg	250198-1	
K2	Audio Coupling	470mmf, 500K, 10000mmf	250209-1	
K3	Horiz. AFC	330K, 1meg, 1meg, 1.2meg 1000mmf, 1000mmf, 4700mmf, 100K, 100K, 470K	250198-1	

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA						NOTES
		MAGNAVOX PART No	Gramar Part No	Mansar Part No	Mant Part No	Miller Part No	Ram Part No	
L1A	1st Video IF	260054-1						
B	4L 25MC Trap							
L2A	2nd Video IF	260044-1						
B	4T 23MC Trap							
L3A	3rd Video IF	260044-1						
B	4T 23MC Trap							
L4	4th Video IF	260043-1		17-4514	17-4514			
L5	Shunt Peaking Coil	260052-15		19-3300	TV-198	6130	VP-5	270uh
L6	RF Choke	260043-23		19-1004	19-1004	DC-565	4610	6uh
L7	Series Peaking Coil	260052-14		19-3075 *	19-3075 *	TV-186	6172 *	VP-3 * 75uh †
L8	Shunt Peaking Coil	260052-9		19-3250	19-3250	TV-185	6181	VP-5 * 33uh
L9	4.5MC Trap	260054-1						
L10	Series Peaking Coil	260052-13		19-3100 *	19-3100 *	TV-194 *	6112 *	VP-3 * 100uh †
L11	1st Sound IF	260072-1		17-3402	17-3402	TV-119 *	1470 *	SF-3
L12	2nd Sound IF	260718-1				TV-149 *		
L13	Quadrature Coil	260716-2		17-1031 ▲	17-1031 ▲	TV-124 ▲	1481 ▲	SD-5
L14	RF Choke	260783-1						3uh

† Wound on 82000 resistor.
* Wound with 82000 resistor.
† Wound on 10K resistor

■ Parallel with 10K resistor.
* Disregard Tap.
* Enlarge mounting hole

▲ Drill mounting holes.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordorson PART No	
L15	62Ω		260676-2	158-5	TV-163	6210	H-102	158-5	Horiz. Freq.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 ~(.)	MAGNAVOX PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
L16	270A	36Ω	8 Hy	320078-1						C-27X ①

① Use original frame

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI	SEC 1	SEC 2	MAGNAVOX PART No.	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T1	127V Lap & 117V ▲ 1.85A	580 VCT @ 270A	5V & 3A	300171-1						
	6.3V @10A	SEC 3	SEC 4	SEC 5						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						
		MAGNAVOX PART No.	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Output	320078-1						
T3	Yoke-Horiz (18 EMU) (20°)-Vert. (65MS)	C360754	Y-52 ①		Y-110 ①	DY-27A ② ③	Y-52 ①	Y-80 ②
	Alternate Yoke	700747-1						TC-110
	Rear Cover & Centering Device	360726-1						
T4	Horiz. Output	C360779-1						
	Alt Horiz Output	320779-1						

① Remove Horizontal & Vertical Damping Networks from yoke Use original rear cover and centering device
② Connect yoke terminal #2 to yoke plug pin #3, yoke terminals #1 and #3 to yoke plug pin #5, yoke terminal #7 to yoke plug pin #8
③ Connect yoke terminal #2 to yoke plug pin #3, yoke terminals #1 and #3 to yoke plug pin #5, yoke terminal #10 to yoke plug pin #8

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	MAGNAVOX PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No	
T5	3100Ω	3-4Ω	320279-1	26850	S-3018	AU-800	A-3823	26850	S-16X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No	QUAM PART No	
SP1	8"	PM	8-4Ω	583585	8A4Z5.6	
SP2	8"	PM	8-4Ω	583785	8A3R28	
SP3	4"	PM	3-4Ω	583779	4A07	
SP4	4"	PM	3-4Ω	583779	4A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	MAGNAVOX PART No	FEDERAL PART No	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		530045-3 ①	KH616 ②	ITI ②		① Selenium Type ② 3 Required

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAGNAVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	MDL	25A 250V S/B	180157-30		313 250 (MDL-1/4A-250V-S/B)		MDL 1/4	AA05
M3	1" Length of #18 Wire							

PARTS LIST & DESCRIPTION (continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N60		1N60	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M5	Tuner	700662-1	VHF (Short Shaft)
	Tuner	700662-2	VHF (Long Shaft)
M6	Switch	160289-1	Phono-TV (DPDT, Slide Type) Ch. 30-01, 05, 10, 11, 12
	Switch	160292-4	Off-TV-Phono (Rotary) Ch. 30-06
	Switch	160292-3	Off-TV-Phono (Rotary) Ch. 30-02, 04, 07

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	140311-106	Volume (Remote Control 700742-1)
Plastic Case	442165-2	Remote Control 700742-1
Pushbutton	140332-1	(3 Used) Remote Control Transmitter 700782
Plastic Case	140330-2	Top, Remote Control Transmitter 700782
Plastic Case	140331-1	Bottom, Remote Control Transmitter 700782

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

PARTS LIST AND DESCRIPTIONS

POWER TUNING UNIT

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T6	117V @ .57A	24V @ 2A		320286-2						

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M7	Switch	160295-1	Program Switch Assembly, Includes Motor Stop switch and AC Off switch
M8	Power Tuning Switch & Cable Assembly	700743	Includes Selector Switch & Cable Assembly
	Motor	500194-1	Includes Motor Run & Muting Switches

REMOTE CONTROL

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R82A B	200K Switch	½	220152-1					Volume Channel Selector (Momentary)

ALIGNMENT INSTRUCTIONS

REMOTE CONTROL RECEIVER 700782 ALIGNMENT

It is recommended that alignment be made using the associated transmitter unit as a signal source.
Remove the bottom of the transmitter case and connect a short clip lead from the positive side of the battery to ground. This will energize the oscillator. Place the transmitter in the vicinity of the receiver during alignment. Alignment may be made with the receiver in the instrument if desired. If so, turn the TV off.
Turn the Remote Receiver on and allow 20 minutes warm-up period. Set the gain control fully clockwise.
Connect the DC probe of the VTVM to point (A). Common to chassis.
Adjust A1, A2 and A3 for maximum negative voltage reading on the VTVM. Repeat several times keeping the signal level below the level that produces -5 volts on the VTVM. The signal level may be varied by rotating the transmitter with relation to the receiver antenna.

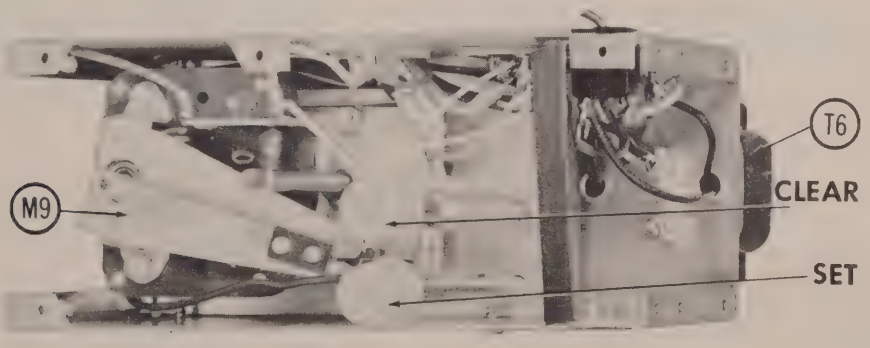
REMOTE CONTROL TRANSMITTER 700781 OSCILLATOR ADJUSTMENTS

The audio oscillator is tuned to a specific frequency by means of a series of controls located in the transmitter. These controls are adjusted at the factory and should not need adjusting unless service is necessary. Remove the back from the transmitter case. Remove the receiver chassis cover so that the reed assembly is visible.
Depress the Channel Select button and while observing the Channel Select reed (the shortest of the five reeds in the receiver), adjust the Channel Select control in the transmitter for maximum vibration of the reed. Turn the control clockwise until the reed just ceases to vibrate, then rotate it counterclockwise 1/3 of the rotation between the two extremes. Repeat this procedure for each of the following:

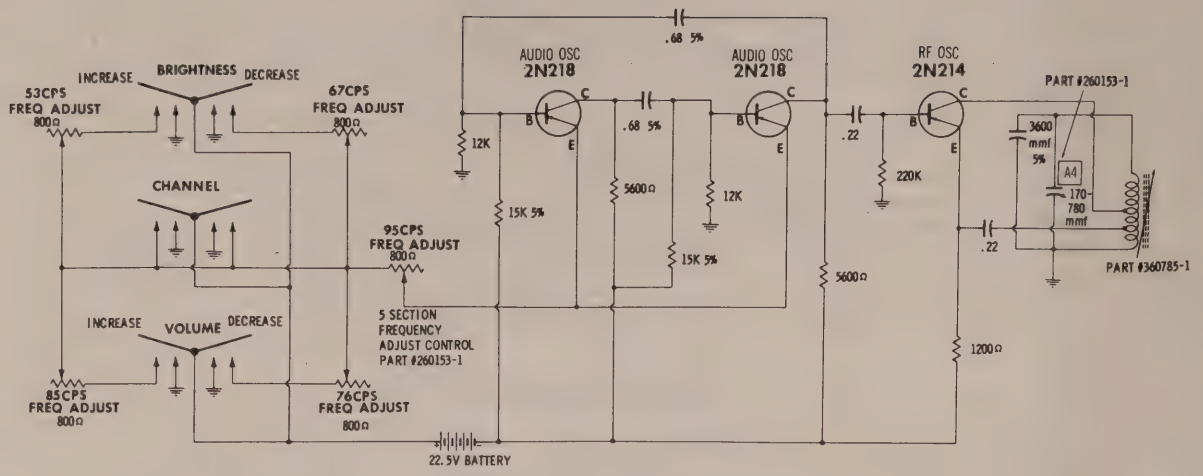
1. Depress the Volume Increase button and adjust the Volume Increase control while observing the Volume Increase reed (second shortest reed).
2. Depress the Volume Decrease button and adjust the Volume Decrease control while observing the Volume Decrease reed (third shortest reed).
3. Depress the Brightness Decrease button and adjust the Brightness Decrease control while observing the Brightness Decrease reed (second longest reed).
4. Depress the Brightness Increase button and adjust the Brightness Increase control while observing the Brightness Increase reed (longest reed).

REMOTE CONTROL TRANSMITTER 700781 CARRIER ALIGNMENT

The associated receiver may be used as an indicator by connecting the DC probe of a VTVM to point (A) of the receiver. Common to chassis.
Remove the bottom of the transmitter case and connect a short clip lead from the positive side of the battery to ground to energize the oscillator. Adjust A4 for maximum indication on the VTVM.
If it is known that the loop antenna of the transmitter has been replaced or tampered with, preset A4 1/4 turn from full clockwise rotation.
Loosen the winding on the antenna nearest the front of the unit as it mounts in the case and slide this winding along the core until maximum indication is obtained on the VTVM. This will result in the proper frequency.
If two units employing the same carrier frequency are to be used in close proximity, it will be necessary to shift the carrier frequency of one of the units slightly. To do this, remove the back cover of the transmitter and turn A4 1/2 turn counterclockwise. This will shift the frequency approximately 4KC. This will naturally necessitate the realignment of the receiver.



POWER TUNING UNIT



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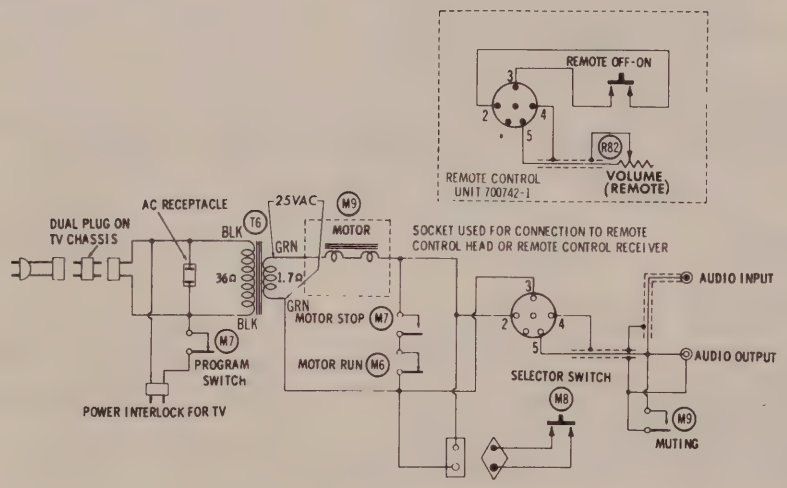
REMOTE CONTROL TRANSMITTER 700782



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POWER TUNING UNIT 700769-2, -5

POWER TUNING ADJUSTMENTS

1. To program channels for power and remote channel selector :
   a. Turn Channel Selector knob manually to set desired channel number to indicator line.
   b. Pull down on "Set" knob and release.
   c. Now when power button is pushed, the tuner will stop on the channel selected in step (1-a).

2. To program automatic power off position :
   a. Turn Channel Selector knob manually to the channel number (at indicator line) at which power off is desired.
   b. Turn "Set" knob to right and pull down to stop position.
   c. Now when tuner indexes at channel selected, the power to the TV will automatically shut off.

3. To clear a channel which is programmed :
   a. Set channel knob (1-a) above.
   b. Push up on "Clear" knob and release.
   c. Now the tuner will not stop on this channel.

TUNER PARTS LIST AND DESCRIPTIONS

700662-1, -2

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		250278						7.5%
C202	30		250279						+7%, -3.5%
C203	28		250280						10%
C204	12		250281						10%
C205	800		250282						
C206	5-10		260149						
C207	47		250283						5%
C208	1-4.5		260148						
C209	800		250282						
C210	800		250282						
C211	1-4.5		260148						
C212	47		250285						10%
C213	30		260284						
C214	1000		250289	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C215	18		250287						N220 10%
C216	7.5		250286						N150 ±.25mmf
C217	1000		250288	EF-001	MFT-1000			503C-D1	
C218	800		250282						

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			Note 1
R202	1000Ω		230104-60	
R203	3900Ω		230104-69	
R204	220K		230104-90	

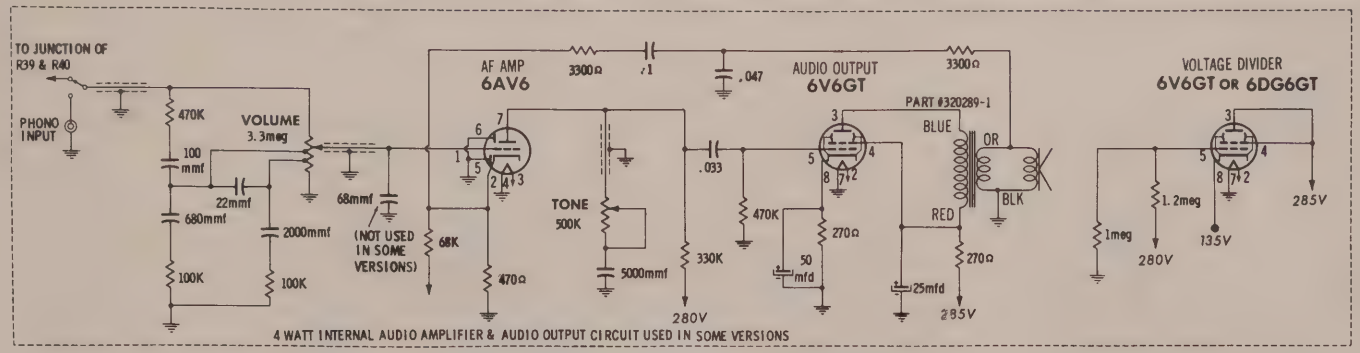
ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R205	10K		230104-74	
R206	3900Ω		230104-69	
R207	1000Ω		230104-62	
R208	3900Ω		230104-69	

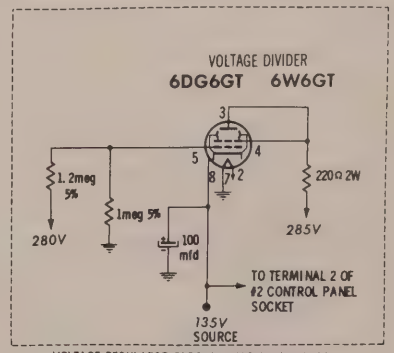
Note 1. Some versions may use 47K in this application.

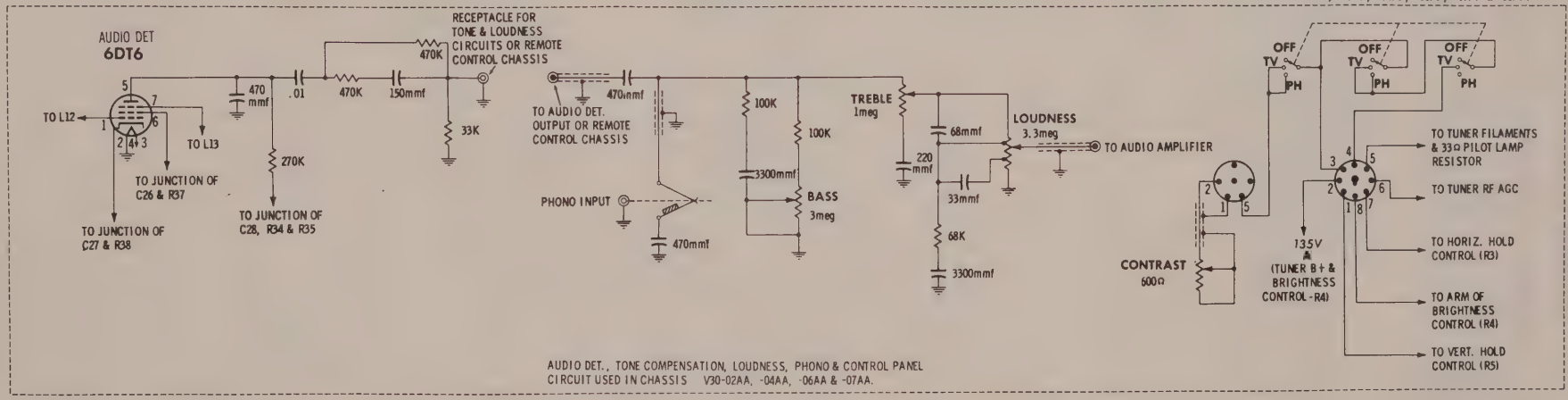
COILS (RF-IF)

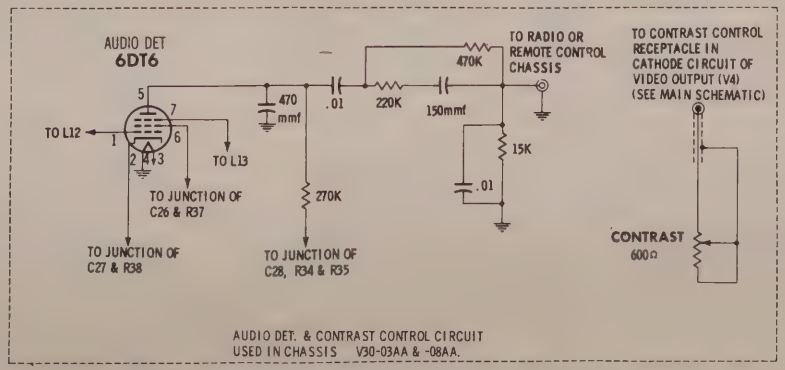
ITEM No.	USE	MAGNAVOX PART No.	NOTES
L201	Ant. Trans. Assy.	360769	
L202	IF Trap Coil	360763	
L203	IF Trap Coil	360764	
L204A	Ant. RF, Mixer Grid, Osc. Coils	360761-2	Channel 2
B	"	360761-3	Channel 3
C	"	360761-4	Channel 4
D	"	360761-5	Channel 5
E	"	360761-6	Channel 6
F	"	360761-7	Channel 7
G	"	360761-8	Channel 8

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L204H	Ant., RF, Mixer Grid, Osc. Coils	360761-9	Channel 9
I	"	360761-10	Channel 10
J	"	360761-11	Channel 11
K	"	360761-12	Channel 12
L	"	360761-13	Channel 13
L205	Fil. Choke	360768	
L206	RF Choke	360766	
L207	Fine Tuning Coil	360767	
L208	Mixer Plate Coil	360765	









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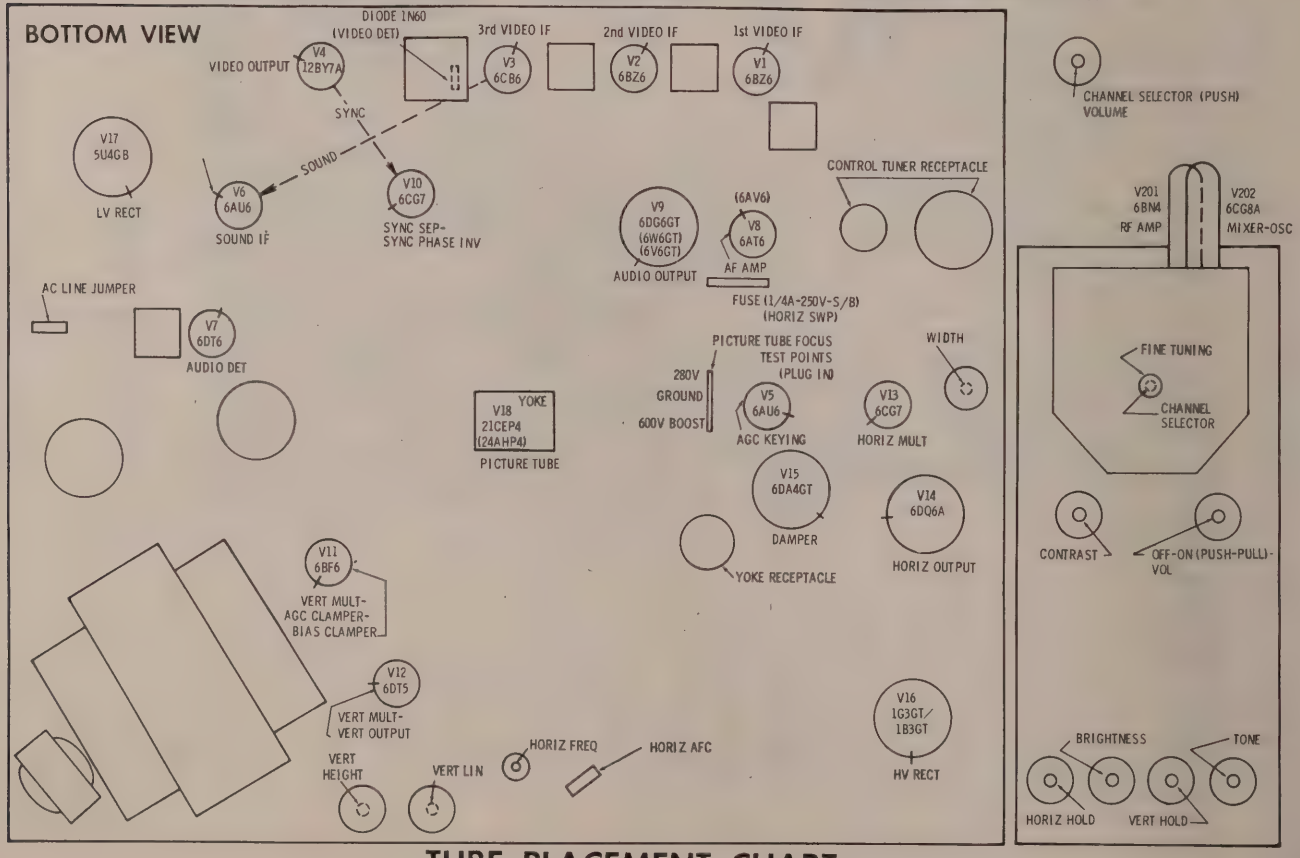
ALTERNATE SCHEMATICS

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

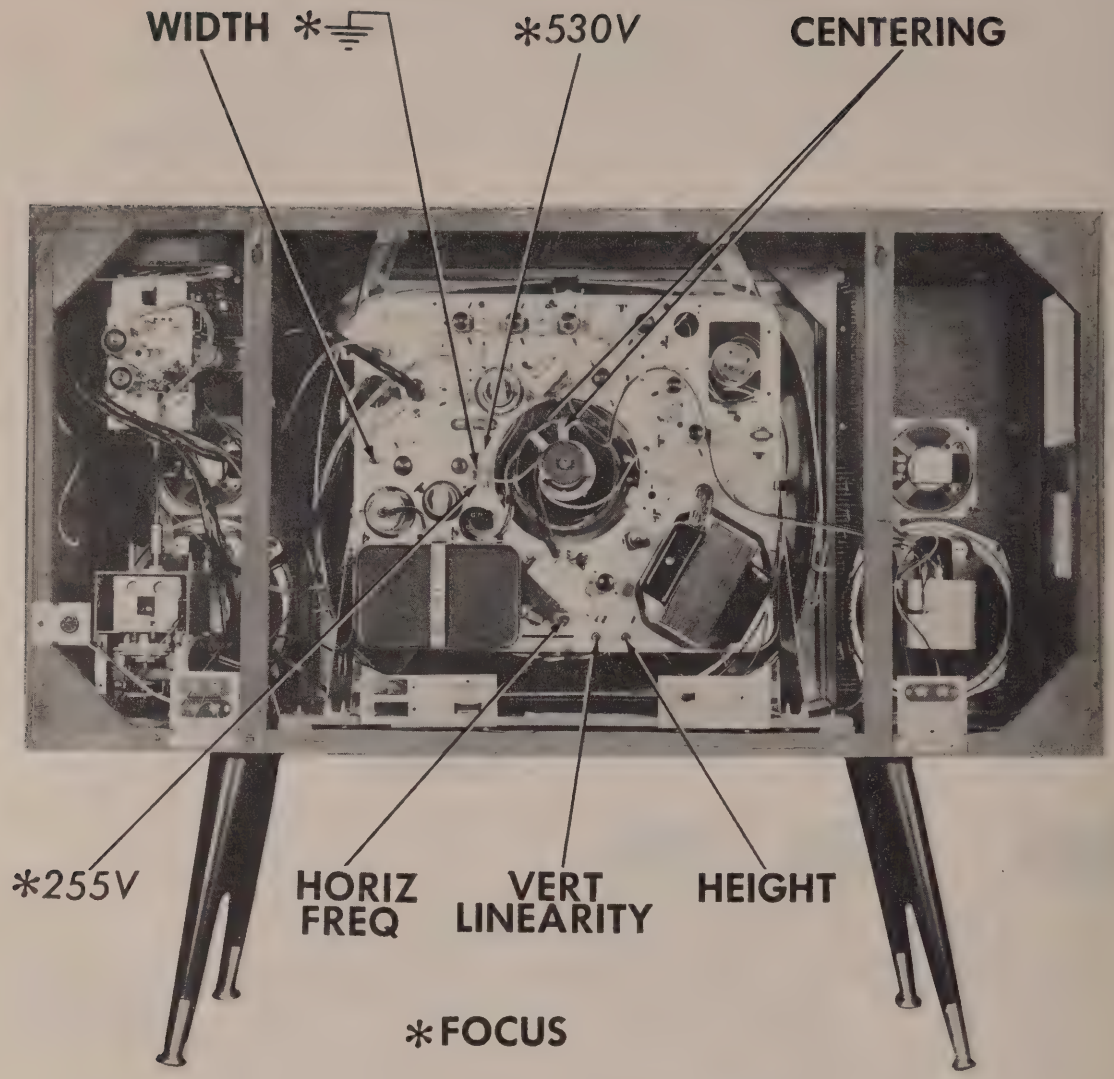
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	59K	47Ω	.1Ω	0Ω	††1500Ω	††1500Ω	0Ω		
V2	6BZ6	57K	47Ω	.1Ω	0Ω	††1500Ω	††1500Ω	0Ω		
V3	6CB6	.1Ω	150Ω	0Ω	.1Ω	††1500Ω	††1500Ω	0Ω		
V4	12BY7A	• 130Ω	3900Ω	0Ω	.1Ω	.1Ω	0Ω	†5300Ω	†22K	0Ω
V5	6AU6	†22K	†1000Ω	0Ω	.1Ω	400K	†150K	†1000Ω		
V6	6AU6	4Ω	0Ω	.1Ω	0Ω	††15K	††15K	270Ω		
V7	6DT6	3.7Ω	680Ω	.1Ω	0Ω	†800K	††6800Ω	470K		
V8	6AT6	4.7meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†330K		
V9	6DG6GT	TP	0Ω	†400Ω	†3500Ω	500K	TP	.1Ω	¶	
V10	6CG7	†1.5meg	4.7meg	0Ω	0Ω	.1Ω	†14K	22K	3300Ω	0Ω
V11	6BF6	•900K	0Ω	0Ω	.1Ω	15K	1.1meg	•†4.3meg		
V12	6DT5	†220Ω	NC	1meg	.1Ω	0Ω	1meg	• 400Ω	NC	†750Ω
V13	6CG7	†7500Ω	2.3meg	1300Ω	0Ω	.1Ω	†47K	•115K	1300Ω	0Ω
V14	6DQ6A	TP	.1Ω	TP	• †13K	1meg	NC	0Ω	0Ω	TOP CAP †18Ω
V15	6DA4G	NC	NC	¶1.3meg	NC	†0Ω	NC	0Ω	.1Ω	
V16	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †460Ω
V17	5U4GB	NC	¶	NC	15Ω	NC	16Ω	NC	¶	
V18	21CEP4	0Ω	†15K	†480K	0Ω	NC	†15K	• 260K	.1Ω	
V201	6BN4	0Ω	1.1meg	0Ω	.1Ω	†1000Ω	0Ω	1.1meg		
V202	6CG8A	3900Ω	††3900Ω	0Ω	0Ω	.1Ω	††1000Ω	††10K	0Ω	220K

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 285V SOURCE. †† MEASURED FROM 135V SOURCE. ‡ MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station, preferably with a test pattern.

Set the Horizontal Hold to the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Check horizontal sync on other channels and if necessary, retouch B1 for best sync on all channels.

Adjust Width control for a picture slightly wider than necessary to fill the picture mask horizontally.

PHOTOFACT* Folder with CIRCUITRACE*

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

MODEL H-17C287 (Ch. V-2365-11)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL H-17C287

1. Remove 5 push-on type knobs from the side.
2. Remove 5 wood screws holding rear cover. Remove the rear cover.
3. Remove speaker and phono leads.
4. Remove 1 wood screw holding antenna terminal board. Remove board.
5. Remove 6 bottom chassis bolts.
6. Remove 2 metal screws holding picture tube brackets.
7. Remove 1 wood screw holding chassis side bracket.
8. Use caution and remove chassis.

MODEL H-17C287 (Ch. V-2365-11)

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-17C287, H-17C288, H-17C289, H-17C290, H-17C291	V-2365-11
		H-17CU287, H-17CU288, H-17CU289, H-17CU290, H-17CU291	V-2365-12
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N.J.		
TYPE SET	Combination Television Receiver & Phono *		
TUBES	VHF: Sixteen, UHF: Seventeen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING	TV 120 Watts, 1.2 Amp. @ 117 Volts AC Phono (Without Motor) 95 Watts, .9 Amp. @ 117 Volts
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

* MAY BE ADAPTED FOR STEREO BY ADDING MODEL H-48SE1, 2, 3, 4, 5 (CHASSIS V-2503-5).
FOR SERVICE INFORMATION SEE PHOTOFACT SET 446, FOLDER 16.
FOR SERVICE INFORMATION ON RECORD CHANGER #670V004H01 SEE SIMILAR UNIT PHOTOFACT SET 408 FOLDER 6.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE DEVICE

A 7.5Ω fusible resistor (R78) is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Mult Trimmer and the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Quieting control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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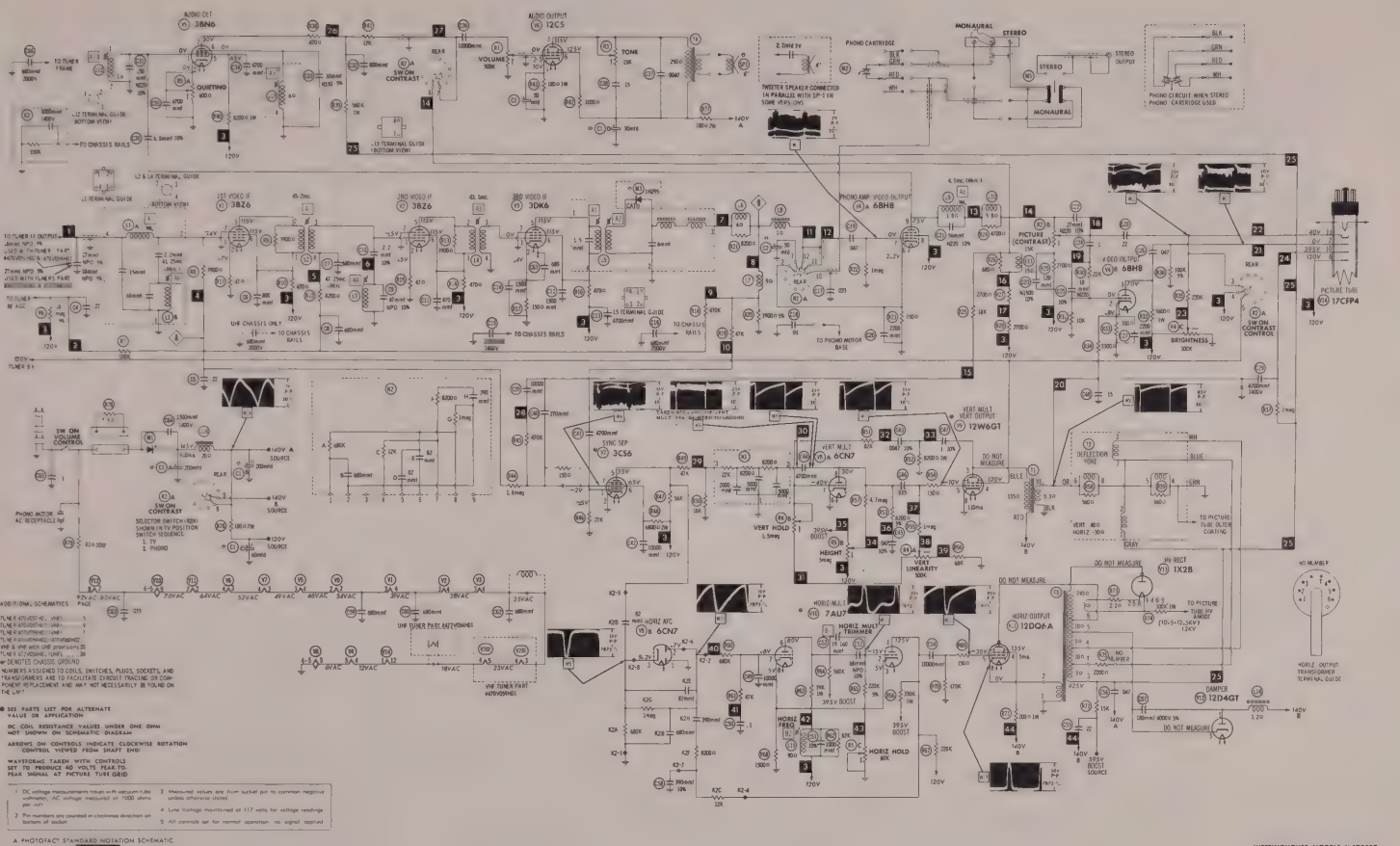
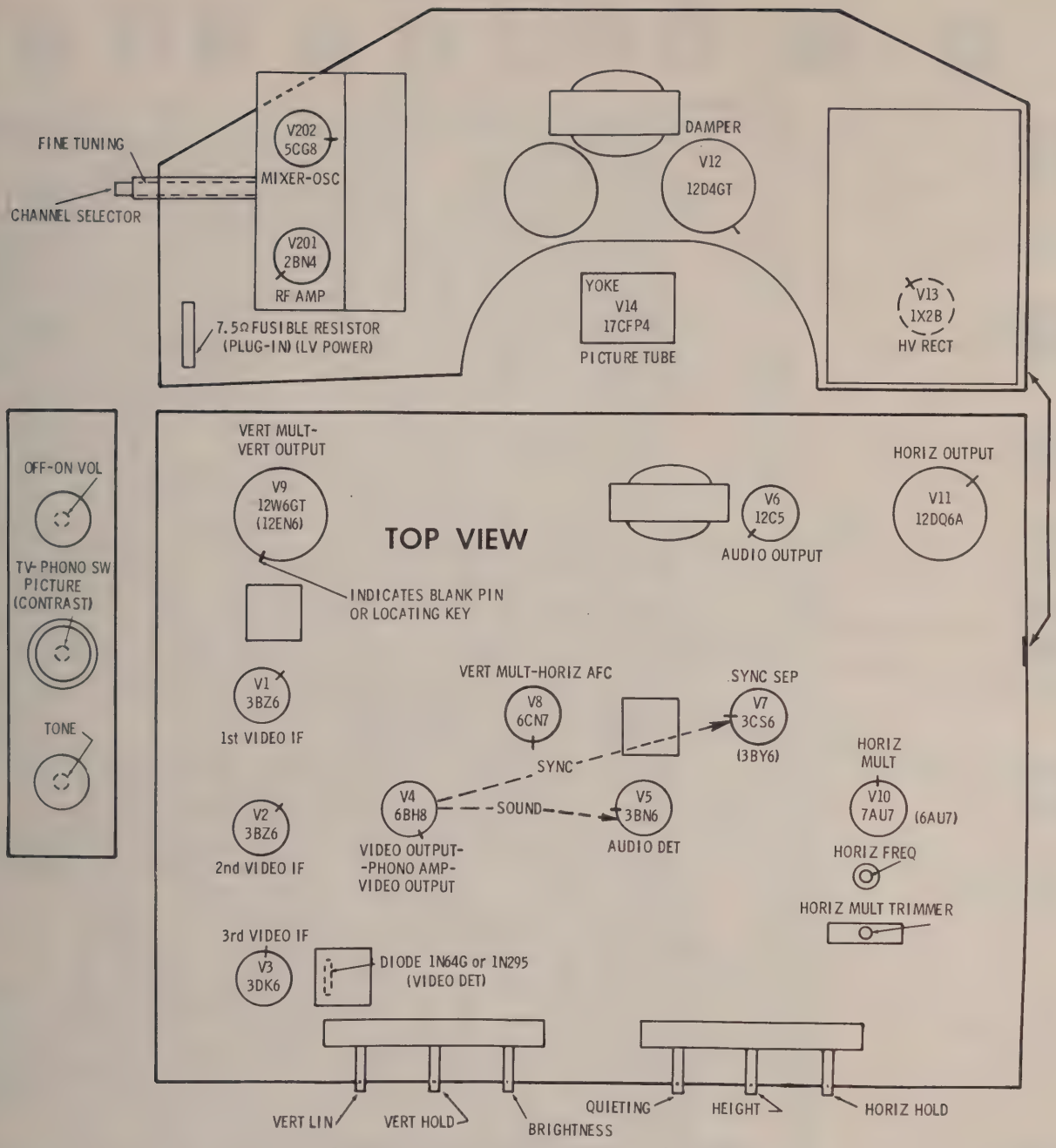
J248

SET 446 FOLDER 2


AUDIO OUT
3BN6
AUDIO OUTPUT
12C5
VOLUME
TONE
QUIETING
SW ON CONTRAST
TWEETER SPEAKER CONNECTED IN PARALLEL WITH SP-1 IN SOME MODELS ONLY
PHONO CARTRIDGE
MONAURAL
STEREO
STEREO OUTPUT
PHONO CIRCUIT WHEN STEREO PHONO CARTRIDGE USED
BLK
GRN
RED
WH
TO TUNER I.F. OUTPUT
TO TUNER R.F. AGC
TO TUNER B+
TO CHASSIS RAILS
1ST VIDEO IF
3BZ6
2ND VIDEO IF
3DK6
3RD VIDEO IF
PHONO AMP-VIDEO OUTPUT
6BH8
PICTURE (CONTRAST)
VIDEO OUTPUT
BRIGHTNESS
SW ON CONTRAST CONTROL
PICTURE TUBE
17CFP4
SW ON VOLUME CONTROL
PHONO MOTOR A.C. RECEPTACLE
SELECTOR SWITCH (REAR) SHOWN IN TV POSITION SWITCH SEQUENCE: 1. TV 2. PHONO
SYNC SEP
3CS6
VERT MULT VERT OUTPUT
12W6GT
VERT MULT
6CN7
VERT HOLD
HEIGHT
VERT LINEARITY
DEFLECTION YOKE
TO PICTURE TUBE OUTER COATING
HV RECT
1X2B
HORIZ OUTPUT
12DQ6A
HORIZ MULT TRIMMER
HORIZ AFC
6CN7
HORIZ MULT
7AU7
HORIZ FREQ
HORIZ HOLD
395V BOOST
DAMPER
12D4GT
DO NOT MEASURE
HORIZ OUTPUT TRANSFORMER TERMINAL GUIDE
UHF TUNER PART 647V934H01
VHF TUNER PART 647V934H01
ADDITIONAL SCHEMATICS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 40 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE GRID
DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
Pin numbers are counted in clockwise direction on bottom of socket
Measured values are from socket pin to common negative unless otherwise stated
Line Voltage maintained at 117 volts for voltage readings
All controls set for normal operation no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
CIRCUITRAK
© Howard W. Sams & Co. Inc. 1959
WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

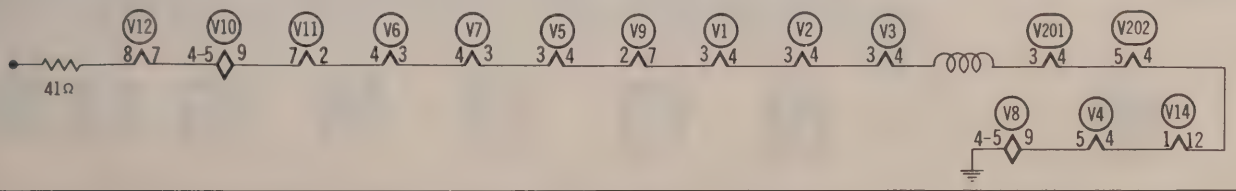
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (7.5Ω), Rect. (B+)

SWEEP FAILURE
No raster, has sound V8, V10, V11, V12, V13, V14, Rect. (B+)
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rect. (B+)
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6

SYNC FAILURE
No vert. sync V7
No horiz. sync V7, V8
No vert. or horiz. sync V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

FOLDER 2

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

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FOLDER 2

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

VHF TUNER 470V057H01

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TUNER PARTS LIST AND DESCRIPTIONS

470V057H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5AT8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100		690V013H10						N2200 10%
C202	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C203	75			N750-DI 75				5TCU-Q75	N750 10% ①
C204	.5-3		690V013H56		829-3				
C205	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C206	68		215V126A80						N150
C207	47								N1500 10% ①
C208	2.2		215V300H09		TCZ-2R2	CTA6V22C			
C209	.5-3		690V013H57		829-3				
C210	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C211	2								②
C212	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C213	33		690V013H01						N750 5%
C214	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C215	6.8		690V013H21	NPO-DI 6.8	DTZ-6R8			5TCCB-V68	NPO 10%
C216	10		690V013H09						N150 5%
C217	2.2								N150 2% ③
C218	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C219	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C220	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C221	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C222	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C223	18		215V131A80			C10Q18C	CNO-418	5TCC-Q18S 5% *	NPO 5% ③

* Not normally in distributors stock. Available through distributor on order to manufacturer.
① Some versions may use 59mmf 10% in this application (Part #690V013H55).
② Some versions may use .68mmf 10% in this application (Part #690V013H53).
③ Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	27K		250V222A73	
R202	47K		250V224A73	
R203	18K		250V221A83	
R204	2200Ω		250V222A22	
R205	4700Ω		250V224A72	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R206	100K		250V221A04	
R207	3300Ω		250V223A32	
R208	1800Ω			Note 1
R209	15K		250V221A53	
R210	4700Ω		250V224A72	

Note 1. Some versions may use 4700Ω in this application (Part #250V224A72).

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L201A	Ant. Trans.	690V013H59	Includes C201, antenna isolation & rear plate assy.

ITEM No.	USE	Westinghouse PART No.	NOTES
L201B L202	IF Trap Coil Mixer Plate Coil	690V013H58	

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER #470V057H01 , H02

Suggested alignment tools: A201 thru A208 ..... General Cement #5009, 8195, 8274, 8275, 8728, 8987
Walsco #2531

VHF OSCILLATOR ALIGNMENT

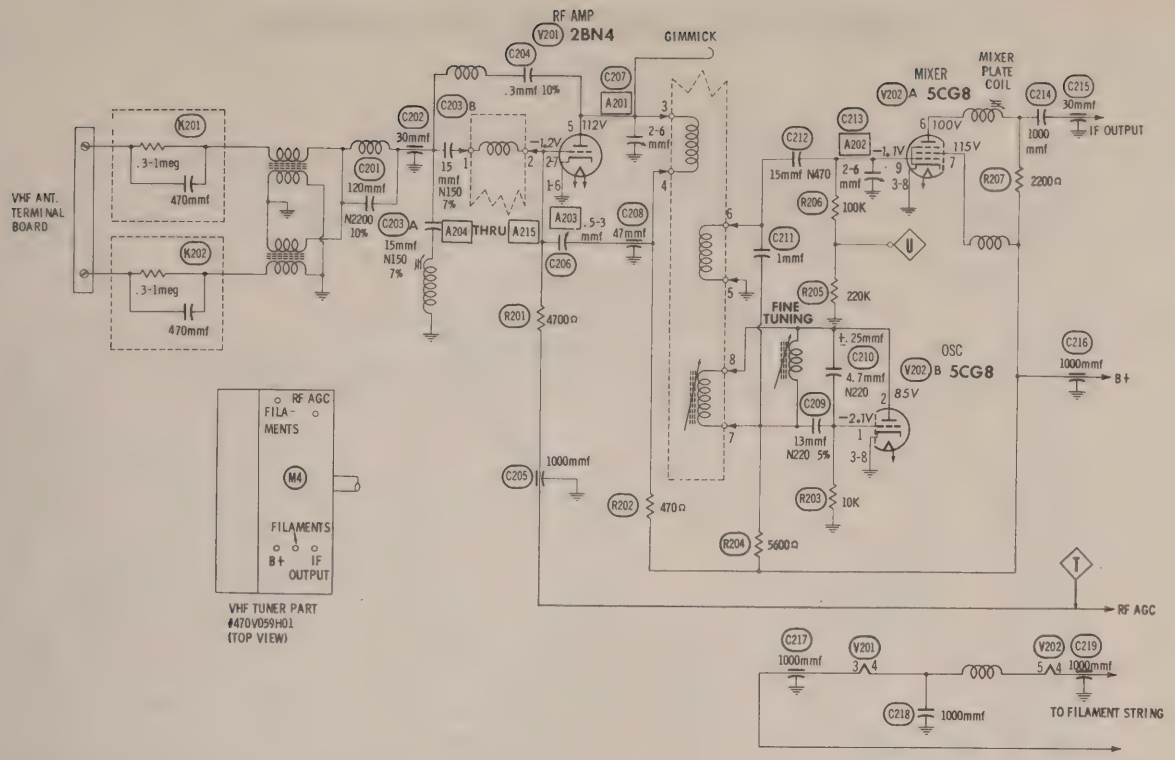
Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest channel operating in the area and adjust the appropriate slug for best picture and sound. The slug for each channel operating in the area must be adjusted in a descending order from the highest to the lowest: A201 for channels 13 and 12, A202 for channels 11 and 10, A203 for channels 9 and 8, A204 for channel 7, A205 for channel 6 and 5, A206 for channels 4 and 3, and A207 for channel 2. If difficulty is experienced in adjusting channels 12, 10, 8, 5 or 3, adjust the correct coil for that channel by compressing or expanding coil turns for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RF TRAP ALIGNMENT

A208 may be adjusted to attenuate any interfering signal between 40MC and 46MC. Observe the picture and adjust for MINIMUM beat interference.



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VHF TUNER 470V059H01

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER 470V059H01

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201, A202, A203 ... GENERAL CEMENT #5000, 5003, 8776, 8290
WALSCO #2512, 2525

RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

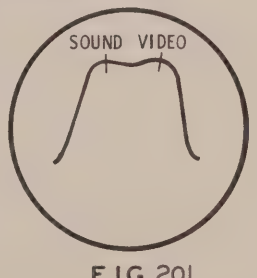


FIG. 201

OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

TUNER PARTS LIST AND DESCRIPTIONS

470V059H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		N2200 10%							
C202	30									
C203A	15		N150 7%							
B	15		N150 7%							
C204	.3		10%							
C205	1000				EF-001	MFT-1000			503C-D1	
C206	.5-10					829-10				
C207	2-6					829-6		CT-552		
C208	47									
C209	13		N220 5%							
C210	4.7		N220±.25mmf							
C211	1.0					TCZ-1			5TCCB-V1	
C212	15		N470							
C213	2-6					829-6		CT-552		
C214	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C215	30									
C216	1000				EF-001	MFT-1000			503C-D1	
C217	1000				EF-001	MFT-1000			503C-D1	
C218	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C219	1000				EF-001	MFT-1000			503C-D1	

RESISTORS

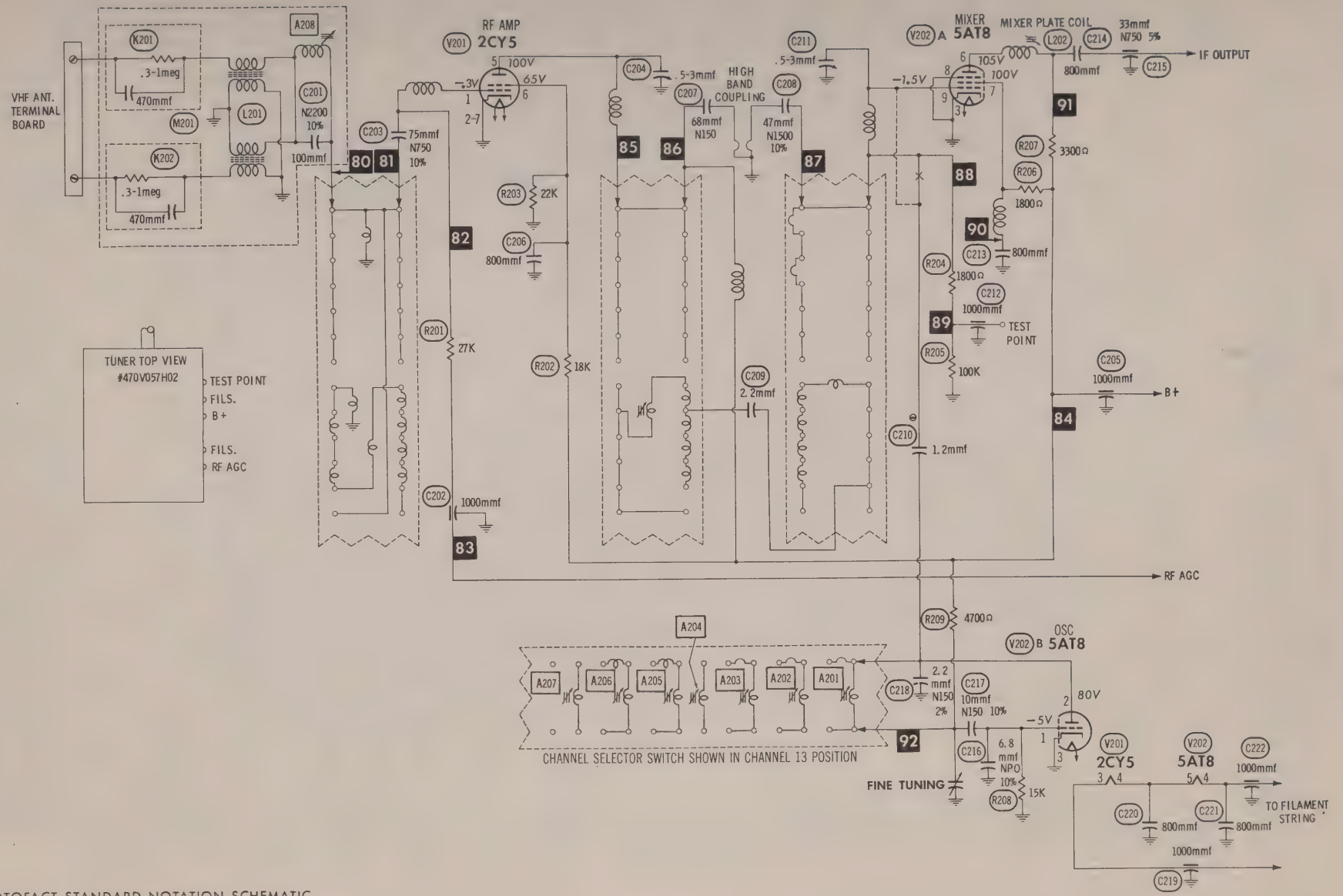
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			
R202	470Ω			
R203	10K			
R204	5600Ω			

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R205	220K			
R206	100K			
R207	2200Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	.3-1meg, 470mm		Centralab	RC-471
				Sprague	AC1-1
K202	Antenna Isolation	.3-1meg, 470mmf		Centralab	RC-471
				Sprague	AC1-1



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VHF TUNER 470V057H02

WESTINGHOUSE MODELS H-17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

TUNER PARTS LIST AND DESCRIPTIONS

470V057H02

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5AT8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100		N2200 19%	690V013H10 †						
C202	1000			690V013H14	EF-001	MFT-1000			503C-D1	
C203	75		N1500	V-8747						
C204	.5-3			690V013H56		829-3				
C205	1000			690V013H14	EF-001	MFT-1000			503C-D1	
C206	800			690V013H13	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C207	68		10%	215V126A80	DI-68	DD-680	L10Q68	CNO-468	5GA-Q68S 10%*	
C208	47		10%	690V004H26	DI-47	DD-470	L10Q47	CNO-447	5GA-Q47S 10% *	
C209	2.2		10%	215V300H09	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22S10%*	
C210	1.2		10%						5TCCB-V12S10%*	①
C211	.5-3			690V013H57		829-3				
C212	1000			690V013H14	EF-001	MFT-1000			503C-D1	
C213	800			690V013H13	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C214	800			690V013H13	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C215	33		N750 10%	690V013H01				CN7-433	5TCU-Q33S 5%	
C216	6.8		NPO 10%	690V013H21	NPO-DI 6.8	DTZ-6R8	C10V68C	CNO-568	5TCCB-V68S10%*	
C217	10		N150 5%	690V013H09						
C218	2.2		N3300 10%	V-19013-1						
C219	1000			690V013H14	EF-001	MFT-1000			503C-D1	
C220	800			690V013H13	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C221	800			690V013H13	BPD-0008	DD-801	L10T8	B-382	5GA-T8	
C222	1000			690V913H14	EF-001	MFT-1000			503C-D1	

† Part of M201.
① Some versions may use .68mmf 10% in this application (Part #690V013H53).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	27K		RC20AE273K	
R202	18K		RC20AE183K	
R203	22K		RC20AE223K	
R204	1800Ω		RC20AE182K	
R205	100K		250V221A04	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R206	1800Ω		RC20AE182K	
R207	3300Ω		RC20AE332K	
R208	15K		RC20AE153J	
R209	4700Ω		250V224A72	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	†	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	†	Centralab Sprague	RC-471 AC1-1

† Part of M201.

COILS (RF-IF)

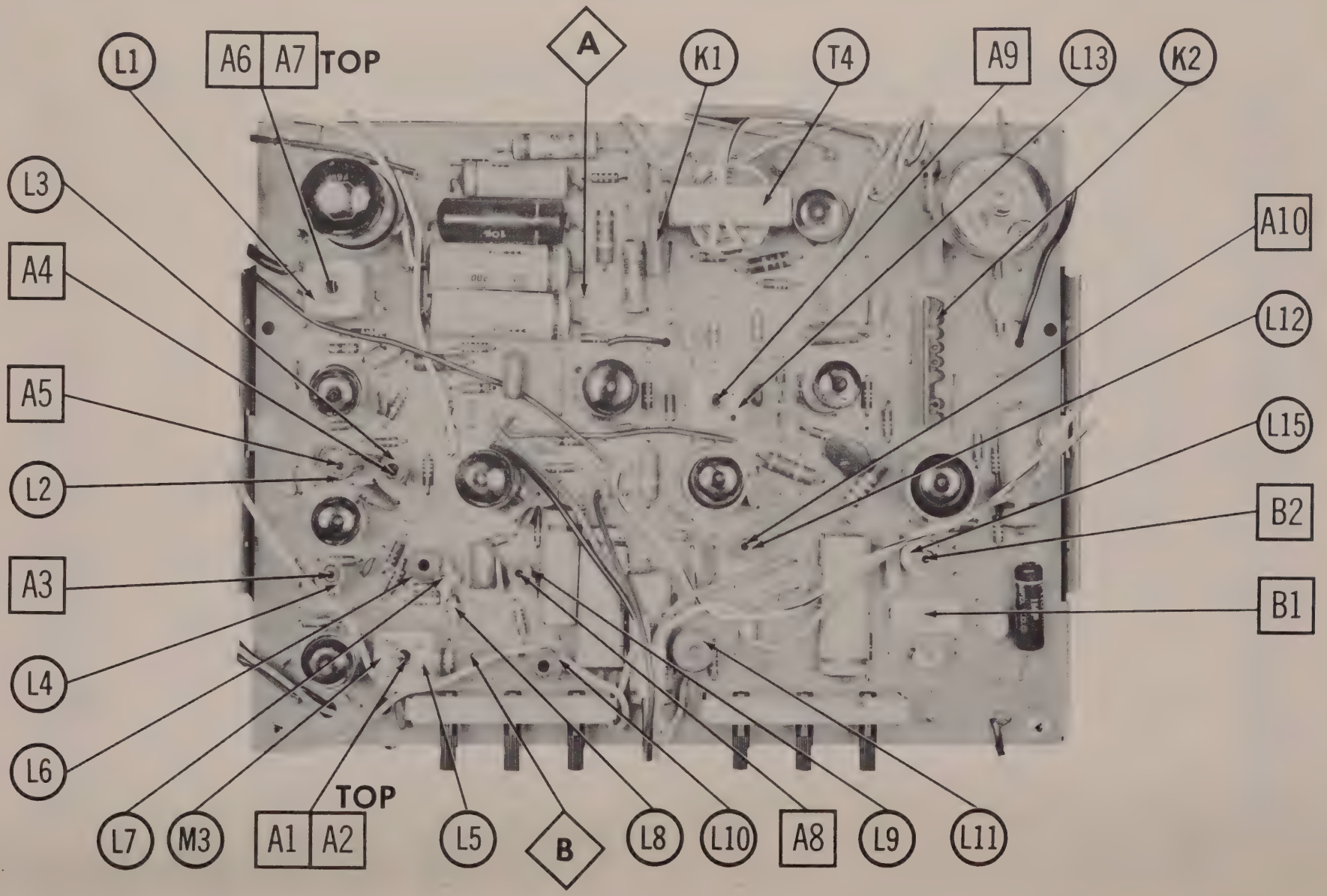
ITEM No.	USE	Westinghouse PART No.	NOTES
L201A	Ant. Trans.	†	† Part of M201.
B	IF Trap Coil	†	† Part of M201.

ITEM No.	USE	Westinghouse PART No.	NOTES
L202	Mixer Plate	690V013H58	

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M201	Antenna Input	690V013H59	Inclues rear plate, C201, L201, K201, K202

PRINTED BOARD CAPACITOR IDENTIFICATION



PRINTED BOARD ALIGNMENT, INDUCTOR & MISC IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Preset A7 fully counterclockwise.
Connect a 470mmf capacitor across the input leads of the VTVM and scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provied a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3rd Video IF. Low side to chassis.	44.0MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)	A1, A2	Preset Mixer Plate Coil by turning slug fully counterclockwise. Adjust A1 for maximum gain. Adjust A2 for flat response.
2.	"	High side to pin 1 (grid) of 1st Video IF. Low side to chassis.	Not used	43.1MC	"	USE VTVM DC probe thru 47K to point (B). Common to chassis.	A3	Adjust for maximum deflection.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to point (B). Low side to chassis.		Retouch A1, A2, A3 and A5 if necessary for response similar to Fig. 1
6.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	41.25MC	"	USE VTVM DC probe thru 47K to point (B). Com Common to chassis.	A6	Adjust for MINIMUM deflection.
7.	Fig. 2	Across antenna terminals thru matching network (Fig. 2).	"	215.75MC	13	"	Fine Tuning	"
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. thru 47K to point (B). Low side to chassis.	Mixer Plate Coil, & A7	Adjust for maximum gain and symmetry of response similar to Fig. 3. with markers as shown. Adjust Mixer Plate Coil for maximum gain and A7 for proper tilt.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (30% 400∿ AM Mod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

TUNER ALIGNMENTS LOCATED ON PAGES 6, 7 & 21.

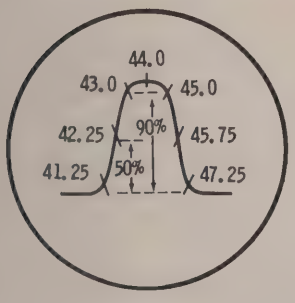
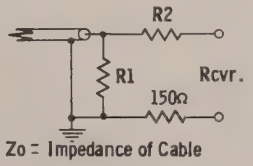


FIG. 1



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 2

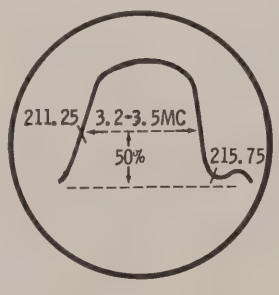


FIG. 3

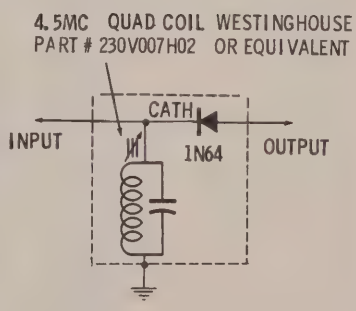


FIG. 4

Continued PAGE 16

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	3DK6	
V4	Video Output-Photo Amp - Video Output	6BH8	
V5	Audio Det	3BN6	
V6	Audio Output	12C5	
V7	Sync Sep	3CS6	3BY6 *
V8	Vert Mult - Horiz AFC	6CN7	
V9	Vert Mult - Vert Output	12W6GT	12EN8 *
V10	Horiz Mult	7AU7	6AU7 *
V11	Horiz Output	12DQ6A	
V12	Damper	12DG4GT	
V13	HV Rect	1X2B	

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA			NOTES
	Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.
V14	17CFP4			17CFP4 ①

① Silver Screen 85

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRANOL PART No.	SPRAGUE PART No.
C1A	200	175	21SV1H8802 ①	XD0015	WP412.1			TVLS-6450 *
B	200	175						
C	180	175						
D	30	175						
C2	50	25	21SV1H8801 ②	PR50V50	BRR50-25	TT25X50	TD-50-50	TVA-1308
C3	50	25	21SV1H8801 ②	PR50V50	BRR50-25	TT25X50	TD-50-50	TVA-1308

① Alternate Part #21SV1H8801. ② Some versions may use a 25mmf ③ 35V in this application with same part number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.22	400		21OV022A34	P488N-22		CUB4P22	GEM-6032	47M-P22
C5	.22	400		21OV022A34	P488N-22		CUB4P22	GEM-6032	47M-P22
C6	680			21SV300E54	BPD-0068	DD-681	L10T8	B-352	5GA-T8
C7	680			R2CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C8	680			R3CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C9	47		NPO 10%	21SV134A70	NPO-DI 47	DT2E-47	CUQ47C	CNO-468	5TCC-Q47S 10%*
C10	2.2		10%	V-5963-3298	NPO-DI 2.2	TCZ-2R2	CUQ2XC	CNO-522	5TCCB-Y22S 10%*
C11	470			21SV503H37	BPD-0047	DD-471	BYA10T47	B-347	5GA-T47
C12	1500			21SV300J31	BPD-0015	DD-152	BYA10D15	B-328	5HK-D15
C13	4700			21SV300D54	BPD-0047	DD-472	BYA10DM47	B-347	5HK-D47
C14	1500			21SV300J31	BPD-0015	DD-152	BYA10D15	B-328	5HK-D15
C15	1500	1600		21SV302A23	HVD-15-1500	DD30-152	HVC15D15	MB-D15	MB-D15
C16	680	3000		21SV300J19	HVD-30-680	DD18-681	HVB30T68	2HV-368	
C17	.033	600		21OV033A33	P488N-033	DF-303	CUB6S33	GEM-6133	47M-S33
C18	.01	600		21OP01M6103M	P488N-01	DF-103	CUB5S1	GEM-611	47M-S1
C19	.047	400		21OV1S4S01	P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47
C20	2200			21SV105A23	BPD-0022	DD-222	BYA10D23	B-323	5HK-D23
C21	56		N330 10%	21SV015A60					
C22	27		N150 10%	21SV032A70					
C23	120		N5500 10%	21SV300H42					
C24	.1	600		21OV05LA04	P488N-1	DF-104	CUB4P1	GEM-401	47M-P1
C25	18		N330 10%	21SV01LA80					
C26	.047	400		21OV1S4S01	P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47
C27	2200			21SV105A23	BPD-0022	DD-222	BYA10D23	B-323	5HK-D23
C28	.22	400		21OV053A34	P488N-22		CUB4P22	GEM-4032	47M-P22
C29	4700	1600		21SV300J31	HVD-15-4700	DD18-472	HVC16D47	2HV-347	MB-D47
C30	6.8		10%	V-5963-3685	NPO-DI 6.8	TCZ-6R8	CUQ6SC	CYI-5668	5TCCB-Y68S 10%*
C31	150		N330 10%	R1CC62T2B5BJK					
C32	800			21SV300E18	BPD-0008	DD-801	L10T8	B-352	5GA-T8
C33	10		N330 5%	21SV300E44			TCA-10		
C34	4700			21SV300H04	BPD-0047	DD-472	BYA10D47	B-347	5HK-D47
C35	4700			21SV300H04	BPD-0047	DD-472	BYA10D47	B-347	5HK-D47
C36	10000			R3CC53Z52J103P	BPD-01	DD-103	BYA10E	B-110	5HK-S1
C37	.0047	600		21OV04LT3	P851N-0047	DS-472	DCS4D47	ACS4347	60Z-D47
C38	.15	600		21OV06LA54	P488N-15		CUB4P15	GEM-6015	47M-P15
C39	10000			21SV105A03	BPD-01	DD-103	BYA10E	B-110	5HK-S1
C40	270			21SV300E26	BPD-00027	DD-271	L10T27	B-327	5GA-T27
C41	4700			21SV300D54	BPD-0047	DD-472	BYA10DM47	B-347	5HK-D47
C42	10000			R2CC53Z52J103P	BPD-01	DD-103	BYA10E	B-110	5HK-S1
C43	.0047	600	10%	21OV1U8U05	V84C8D47		PME5D47	GTM-6247	47M-D47
C44	4700	600		21SV300H04	BPD-0047	DD-472	BYA10D47	B-347	5HK-D47
C45	.047	600	10%	21OV1U8U03	V84C5S47		PME5S47	GTM-6147	47M-S47
C46	.015	600		21OV05LA52	P488N-015		CUB4S15	GEM-6115	47M-S15
C47	.01	600	10%	21OV1U8U04	V84C5P1		PME5P1	GTM-6101	47M-P1
C48	.15	400		21OV06LA54	P488N-15		CUB4P15	GEM-6015	47M-P15
C49	10000			21SV105A03	BPD-01	DD-103	BYA10E	B-110	5HK-S1
C50	.1	400		21OV05LA04	P488N-1	DF-104	CUB4P1	GEM-401	47M-P1
C51	1000	1000	10%	21SV312H03			IR31K	MCB25	MB-S1
C52	68		NPO 10%	21SV126A80	NPO-IX 68	DTZ-68	CUQ68C	CNO-468	5TCC-Q68S 10%*
C53	19-180			21TV80J01					
C54	10000			R3CC53Z52J103P	BPD-01	DD-103	BYA10E	B-110	5HK-S1
C55	.22	400		21OV052A34	P488N-22		CUB4P22	GEM-6032	47M-P22
C56	.047	600		21OV28A78	P488N-047	DF-503	CUB5S47	GEM-6147	47M-S47
C57	180	6000	5%	21SV300E30					50GA-T18S 5%*
C58	180		10%	21SV12E18	1468-00039	MD-3R1	5RS739	MCB343	MB-339
C59	680			R3CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C60	680			R2CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C61	680			R3CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C62	680			R2CC51Z526BJP	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68
C63	.033	600		21OV33A33	P488N-033		CUB6S33	GEM-6133	47M-S33
C64	1500	1600		21SV30LA53	HVD-15-1500	DD30-152	HVC15D15	2HV-215	MB-D15
C65	.1	600		21OV2LA04	P488N-1	DF-104	CUB4P1	GEM-401	47M-P1
C66	680	3000		21SV300J29	HVD-30-680	DD30-681	HVB30T68	2HV-368	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1	27OV056H01	B-50-G Not Req. Not Req.	A47-500K-2	Q13-133 Not Req.	U48 Not Req.	Volume
B	Shaft				F8-3	Not Req.	U8-38	
C	Switch				89PS-13	TG-1		Power Off-On Selector Switch
R2A	500K		75SV035H01					Picture (Contrast)
B	15K							Tone
R3A	15K		27OV003H06	B-23 Not Req.	A47-15K-S	H11-118	TA153L	
B	Shaft				F8-3	SK1	Not Req.	
R4A	500K		27OV019H07					Vert. Lin.
B	1 Smeg							Vert Hold
C	100K							Brightness
R5A	500Ω		27OV019H06					Quieting
B	5meg							Height
C	60K							Horiz. Hold

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No	NOTES
	OHMS	WATT		
R6	18meg 5%		25OV21A86	
R7	100K		25SV22A04	
R8	3900Ω		25SV003H02	
R9	3900Ω		25SV003H02	
R10	470Ω		25SV224A70	
R11	47Ω		RC20AE470K	
R12	820Ω		RC20AE822K	
R13	3900Ω		25SV003H02	
R14	470Ω		25SV224A70	
R15	47Ω		RC20AE470K	
R16	470Ω		25SV224A70	
R17	150Ω		RC20AF151K	
R18	470K		25SV24A74	
R19	47K		25SV164A73	
R20	3900Ω 5%		25SV21A82	
R21	8200Ω		RC30AA823K	
R22	1meg		25SV31LA05	
R23	100Ω		RC30AA101K	
R24	470Ω		25SV224A70	
R25	18K		RC30AE183K	
R26	680Ω		25SV228A86	
R27	2700Ω		RC20AE272K	
R28	2700Ω		RC30AE272K	
R29	2700Ω		RC30AE272K	
R30	22K		RC30AE223K	
R31	10K		RC30AE103K	
R32	5600Ω	1	RC30AE562K	
R33	100Ω		25SV22LA01	
R34	3300Ω		RC20AE332K	
R35	220K		25SV223AA4	
R36	100Ω 5%		25SV22LA36	
R37	1meg		25SV21LA09	
R38	470Ω		25SV224A70	
R39	560K	1	25SV32SA64	
R40	820Ω	1	RC30AE822K	
R41	12K		RC30AE123K	
R42	1000Ω		25SV22LA02	
R43	180Ω	1	RC30AE180K	
R44	1.5meg		RC30AE158K	
R45	470K		25SV24A74	
R46	27K		RC20AE273K	
R47	56K		RC20AE563K	
R48	6800Ω	2	RC42AE682K	
R49	47K		25SV24A73	
R50	18K		RC20AE183K	
R51	82K		RC20AE823K	
R52	8200Ω	1	RC30AE822K	
R53	9200Ω 5%		25SV28A22	
R54	150Ω		RC30AE151K	
R55	1meg		25SV21LA05	
R56	56K		RC20AE563K	
R57	4.7meg		RC20AE475K	
R58	560Ω		RC20AE561K	
R59	560Ω		RC20AE561K	
R60	680K		25SV226A84	
R61	47K		25SV24A73	
R62	82K		RC20AE823K	
R63	820K	1	RC30AE824K	
R64	560K		RC20AE564K	
R65	220K 5%		25SV22LA24	
R66	330K	1	RC30AE334K	
R67	230K		25SV223AA4	
R68	180Ω		RC20AE181K	
R69	120Ω		RC20AF151K	
R70	470K		25SV24A74	
R71	100Ω	1	25V32LA01	
R72	15K		RC20AE153J	
R73	2.2Ω		25SV002A28	
R74	100K	1	25V90SH09	
R75	2200Ω		RC20AE222K	
R76	180Ω	7	25V020J52	
R77	180Ω	2	RC40AE181K	
R78	7.5Ω		25SV07H02	
R79	4Ω	20	25VG7H02	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No	REPLACEMENT DATA
K1	Vert. Integrator	3000mmf, 5000mmf, 5000mmf, 6200Ω, 820Ω, 22K	21SV003H01	Aerovox PA-501 Centralab PC-104 Cornell-Dubilier 15T16 Sprague VI/V3
K2	Horiz. AFC	82mmf, 82mmf, 390mmf, 560mmf, 820Ω, 12K, 680K, 1meg	21SV003H05	
K3	Chassis Isolation	1000mmf ③ 1400V, 330K	21SV004H05	Sprague ACI-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Westinghouse PART No.	Grayner PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rem PART No.	
L1A	1st Video IF	25SV003H01						
B	42.25MC Trap							
L2	2nd Video IF	25SV004H01						
L3	47.25MC Trap	25SV004H01						
L4	3rd Video IF	25SV004H01						
L5	4th Video IF	25SV005H02						
L6	Series Peaking Coil	23OV01LH4	19-3100	19-3100	TV-181	6181	VP-2	Includes M3.
L7	Shunt Peaking Coil	23OV02H13	19-3250	19-3250	TV-185	6181	VP-6	100 uh
L8	RF Choke	23OV01H10	19-1006	19-1006	4634			250 uh
L9	4.5MC Trap	25SV023H01						14 uh
L10	Series Peaking Coil	V-15785-4	19-3180	19-3180	TV-194	6180	VP-5	170 uh
L11	Shunt Peaking Coil	23OV02H09	19-3500	19-3500	TV-305	6174	VP-8	500 uh
L12	1st Sound IF	23OV027H02						
L13	Quadrature Coil	23OV007H03						
L14	RF Choke	23OV01H10	19-1006	19-1006	4634			14 uh

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA					NOTES
	PRI	SEC	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Thordarson PART No.
L15	90Ω		23OV005A01					

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA					
	CURRENT (Measured)	DC RES.	INDUCTANCE ID CURRENT 1000 (Ma.)	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.310A	30Ω	.5 Hy.	43OV064H01						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	43OV053H01	26971	A-2822	MDP-92	P-8	PCM2045	DY-16A	28S71	V-41 & N-42
T2	Yoke-Horiz (23MH) (90°) Vert (38MH)	43OV001H04	Y-16 ① ②		① ② ③		① ② ③	Y-16 ① ②	Y-16 ① ②	YC-1
	Rear Cover & Centering Device	78V083H02								
T3	Horiz. Output	49SV004H08								D-154

① Connect same as original ② Use original rear cover and centering device. ③ Remove Horizontal Damping Network from yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	2700Ω	3-4Ω	43OV066H01	22845 ①	A-2928 ①	AU-603 ①	A-3876 ①	22845 ①	S-1X ①	① Use original frame

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	Westinghouse PART No.	QUAM PART No.	
SP1	6"	P.M.	3-4Ω	57OV056H01 ①	6AJ	① Used in all Models
	4"	P.M.		57OV058H01 ②		② Used in all Models except H-17C287, H-17CU287

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Westinghouse PART No	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	310A	295V006H03 ①	HF504 ①		SD94A ①	M500 ①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	Westinghouse PART No.	REPLACEMENT DATA		REMARKS
		ASTATIC (STYLUS)	JENSEN (STYLUS)	
M2		81T *	3 (CARTRIDGE) (STYLUS)	* Includes needles

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Westinghouse PART No.	CBS PART No.	SYLVANIA PART No	
M3	1N295 *	295V002H01	1N60	1N295	Video Det. (Digital) * Some versions may use 1N54G in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuner	47OV059H01	VHF Ch. V-2365-11
	Tuner	47OV057H01	VHF Ch. V-2365-11
	Tuner	47OV057H02	VHF Ch. V-2365-11
	Tuner	47OV059H02	VHF Ch. V-2365-11
	Tuner	47OV060H02	VHF with UHF provisions, Ch. V-2365-12
	Tuner	47SV054H01	UHF Ch. V-2365-12
M5	Switch	75SV029H01	Monaural-Stereo
	Printed Board	25SV044H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	63OV016H02	All Models except H-17C287, H-17CU287
Safety Glass	63OV016H01	All Models H-17C287, H-17CU287
Mask	61OV048H02	All Models except H-17C287, H-17CU287
Mask	61OV048H03	Models H-17C287, H-17CU287
Knob	55OV032H06	Channel Selector, VHF Models
Knob	55OV032H07	Channel Selector, UHF-VHF Models

WESTINGHOUSE MODELS H17C287, 288, 289, 290, 291, H-17CU287, 288, 289, 290, 291 (Ch. V-2365-11, -12)

FOLDER 2

PARTS LIST & DESCRIPTION (continued)

CABINETS & CABINET PARTS (cont)

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V050H01	UHF Channel Selector
Knob	550V031H05	Fine Tuning, VHF Models
Knob	550V029H08	Fine Tuning, UHF-VHF Models
Cabinet	516V067H01	Model H-17C287
Cabinet	516V067H02	Model H-17CU287
Cabinet	516V067H09	Model H-17C288
Cabinet	516V067H10	Model H-17CU288
Cabinet	516V067H03	Model H-17C289
Cabinet	516V067H04	Model H-17CU289
Cabinet	516V067H05	Model H-17C290
Cabinet	516V067H06	Model H-17CU290
Cabinet	516V067H07	Model H-17C291
Cabinet	516V067H08	Model H-17CU291
Leg	518V001H19	Models H-17C287, H-17CU287
Leg	518V001H20	Models H-17C288, H-17CU288
Leg	518V001H16	Models H-17C289, H-17CU289
Leg	518V001H18	Models H-17C290, H-17CU290
Leg	518V001H17	Models H-17C291, H-17CU291
Lid	690V012H50	Models H-17C287, H-17CU287
Lid	690V012H54	Models H-17C288, H-17CU288
Lid	690V012H51	Models H-17C289, H-17CU289
Lid	690V012H52	Models H-17C290, H-17CU290
Lid	690V012H53	Models H-17C291, H-17CU291

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

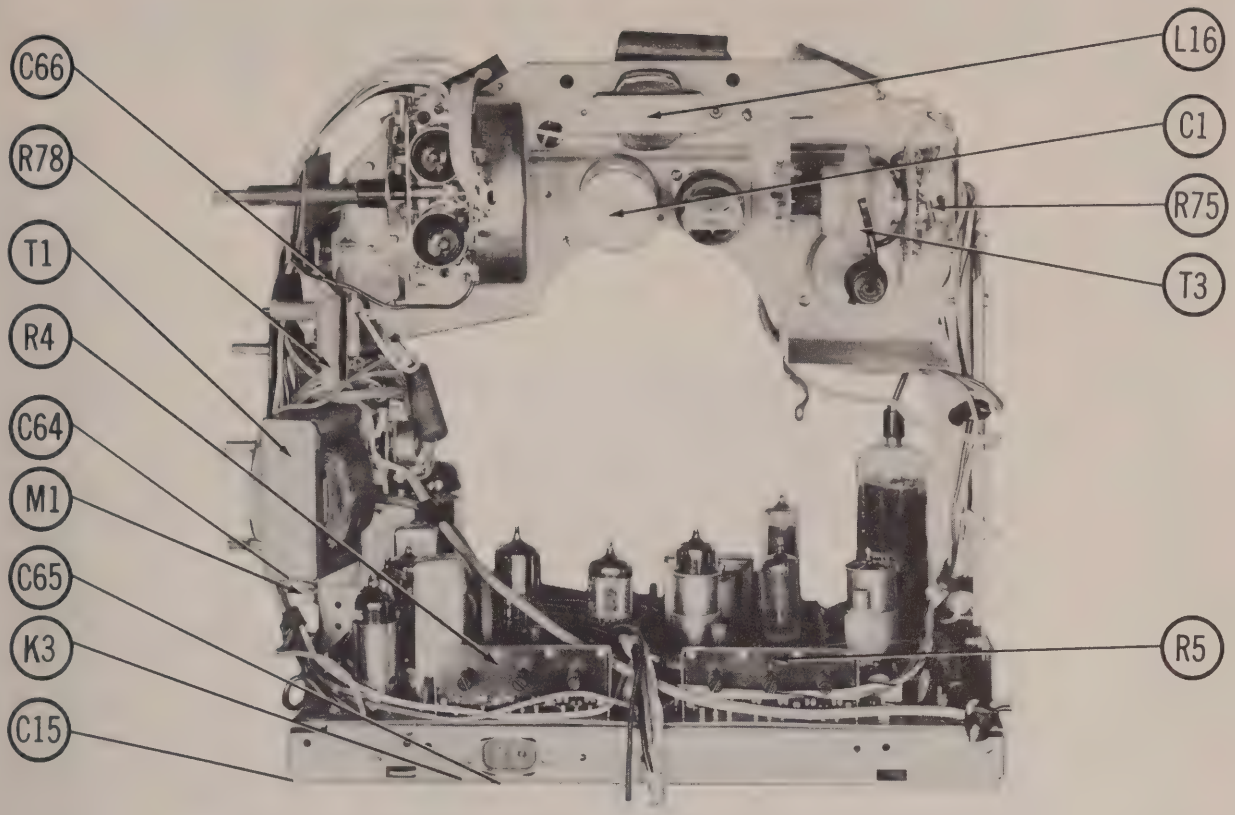
ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

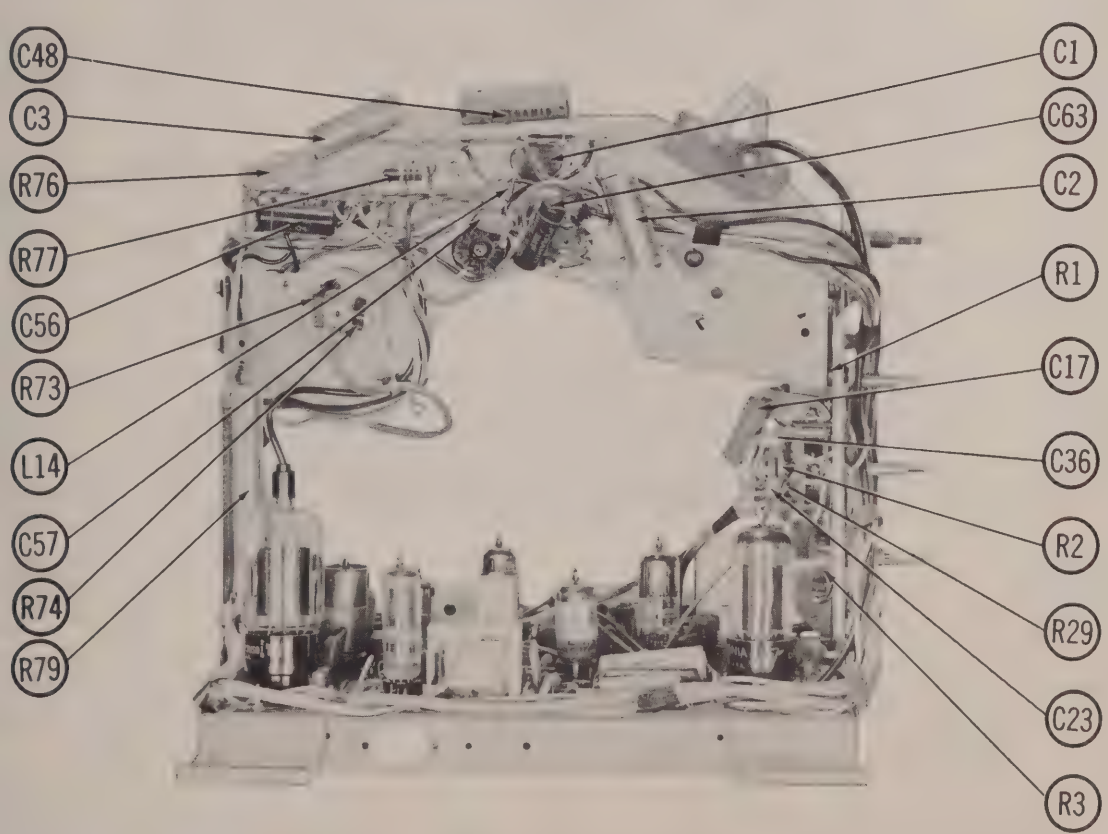
Connect the DC probe of a VTVM thru a 4.5MC detector probe (Fig. 4) to pin 2 (grid) of the Audio Detector. Common to chassis.
Tune in the strongest TV signal available and set the Quieting control to the center of its range.
Set the Volume at a low level and adjust A9 for maximum volume.
Reduce the signal strength at the antenna. Use either loose coupling or an attenuator pad at the antenna terminals. Adjust A10 for maximum negative voltage on the VTVM.
Reduce the volume to a low sound level and attenuate the signal level at the antenna terminals until a negative reading of 1 volt is obtained on the VTVM. Readjust A9 for maximum volume.
Select the strongest TV signal available and turn the Fine Tuning away from best picture to the point where -1.5 volts is obtained on the VTVM. (It may be necessary to misadjust the tuner oscillator slug to do this. If so, be sure to readjust the oscillator slug when finished.)
Adjust the Quieting control for MINIMUM buzz.

ALTERNATE SOUND IF ALIGNMENT USING SIGNAL GENERATOR

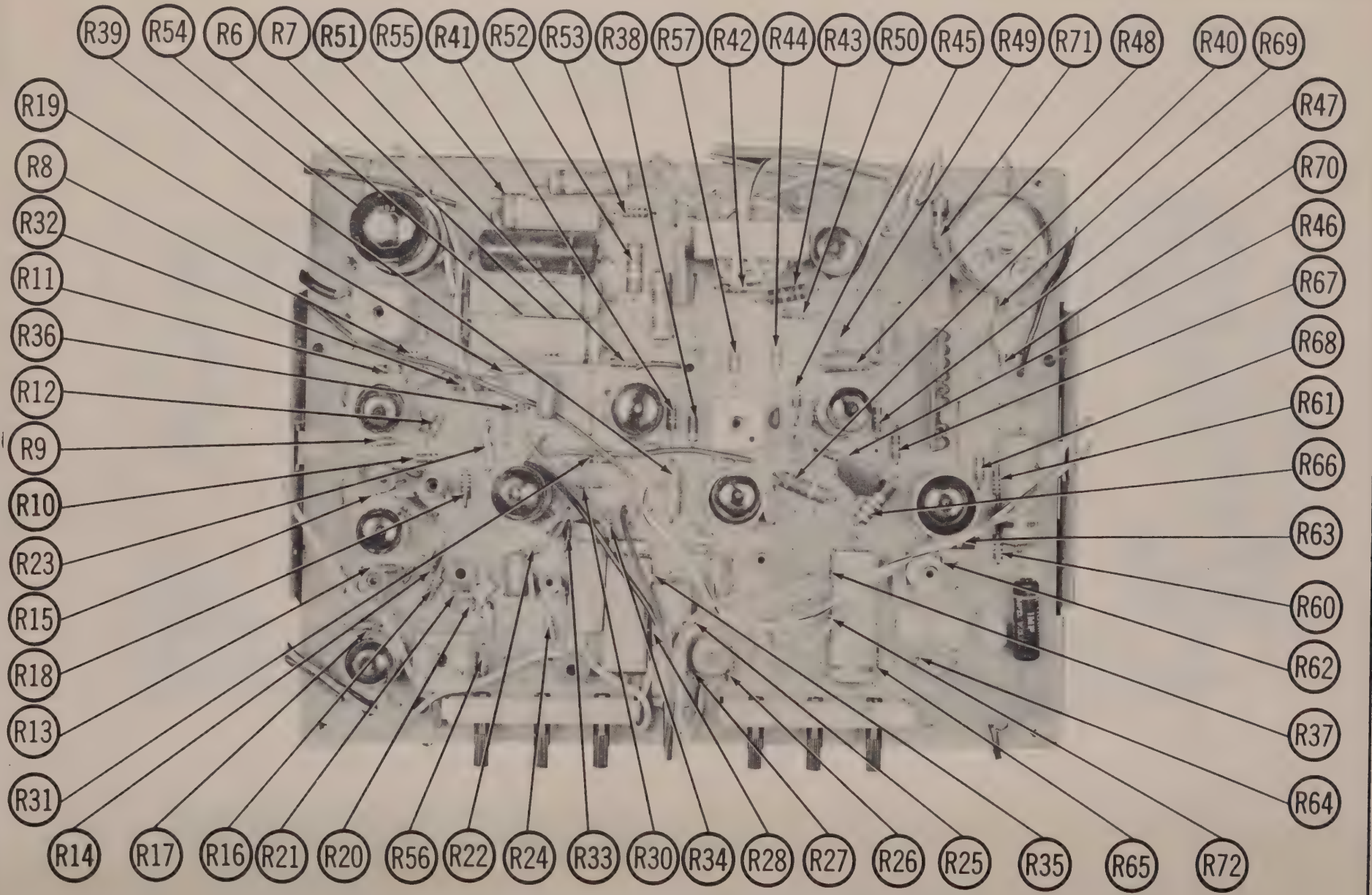
Connect a high impedance AC voltmeter or scope across the Volume control to serve as an indicator.
Set the Quieting control to the center of its range.
Apply a 4.5MC FM signal (15KC Swp) to point (B) . Connect low side to chassis.
Using a strong signal, adjust A9 for maximum deflection.
Reduce the signal to the lowest point that will provide an indication. Adjust A10 for maximum deflection.
Replace the FM signal with a 4.5MC AM signal (30% Mod.) and adjust the generator for a strong output.
Adjust the Quieting control for MINIMUM indication.



CHASSIS FRONT VIEW

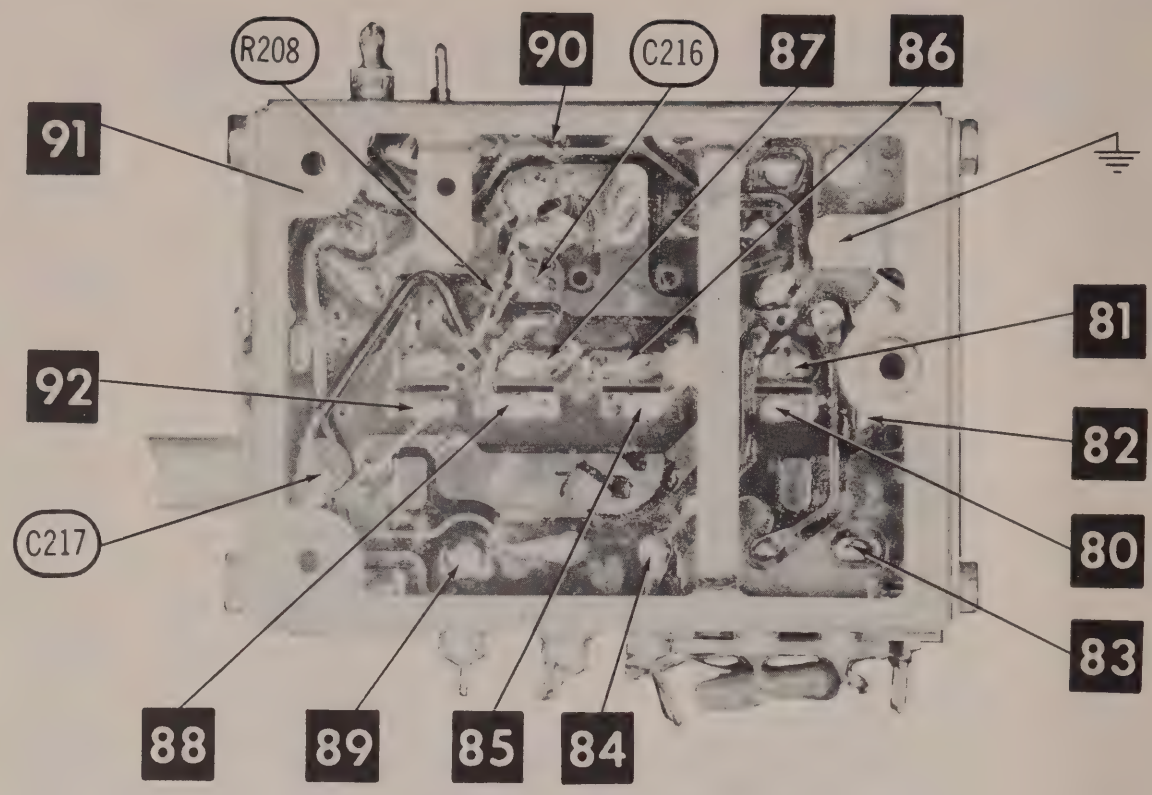


CHASSIS FRONT VIEW



PRINTED BOARD RESISTOR IDENTIFICATION

TUNER 470V057H02 - TOP VIEW



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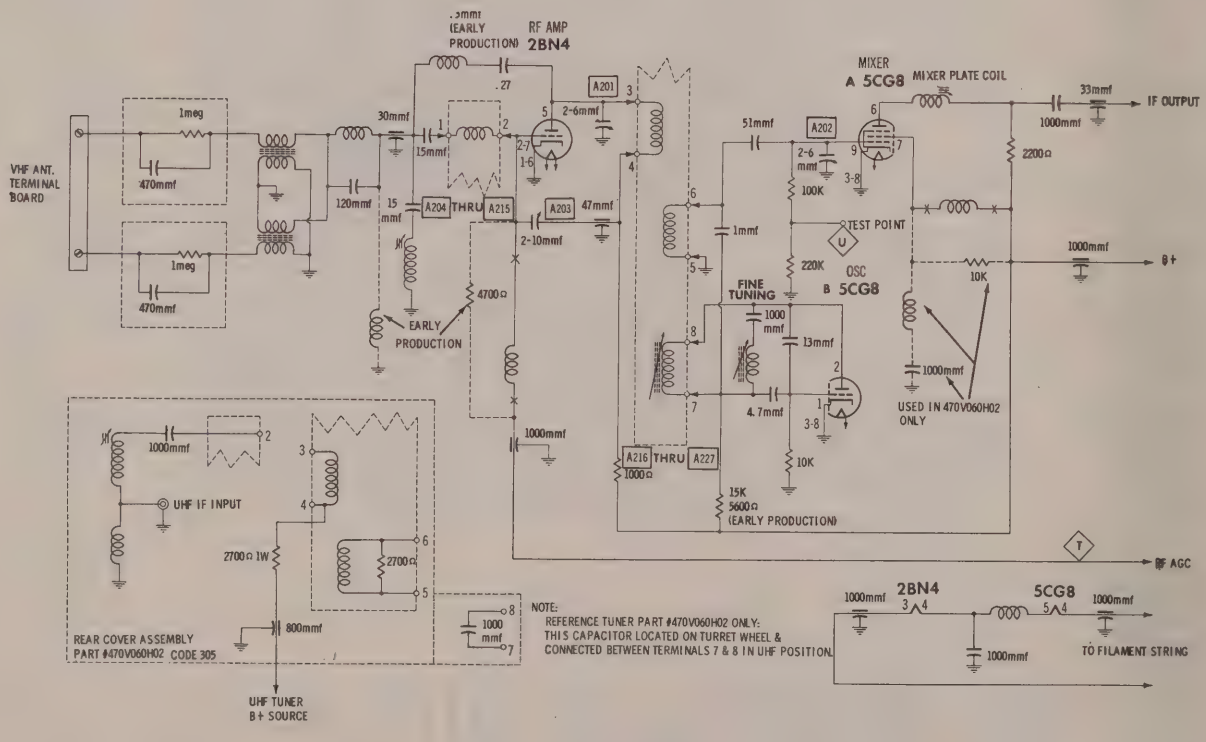
TUNER 470V057H02 BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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VHF TUNER 470V059H02, with UHF provisions, 470V060H02

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNERS 470V059H02, 470V060H02

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓣ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

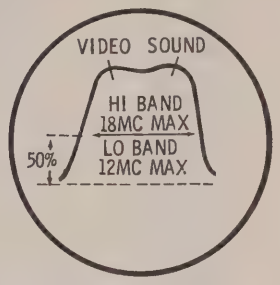


FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A227	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

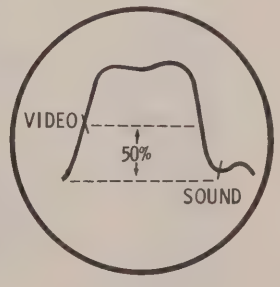
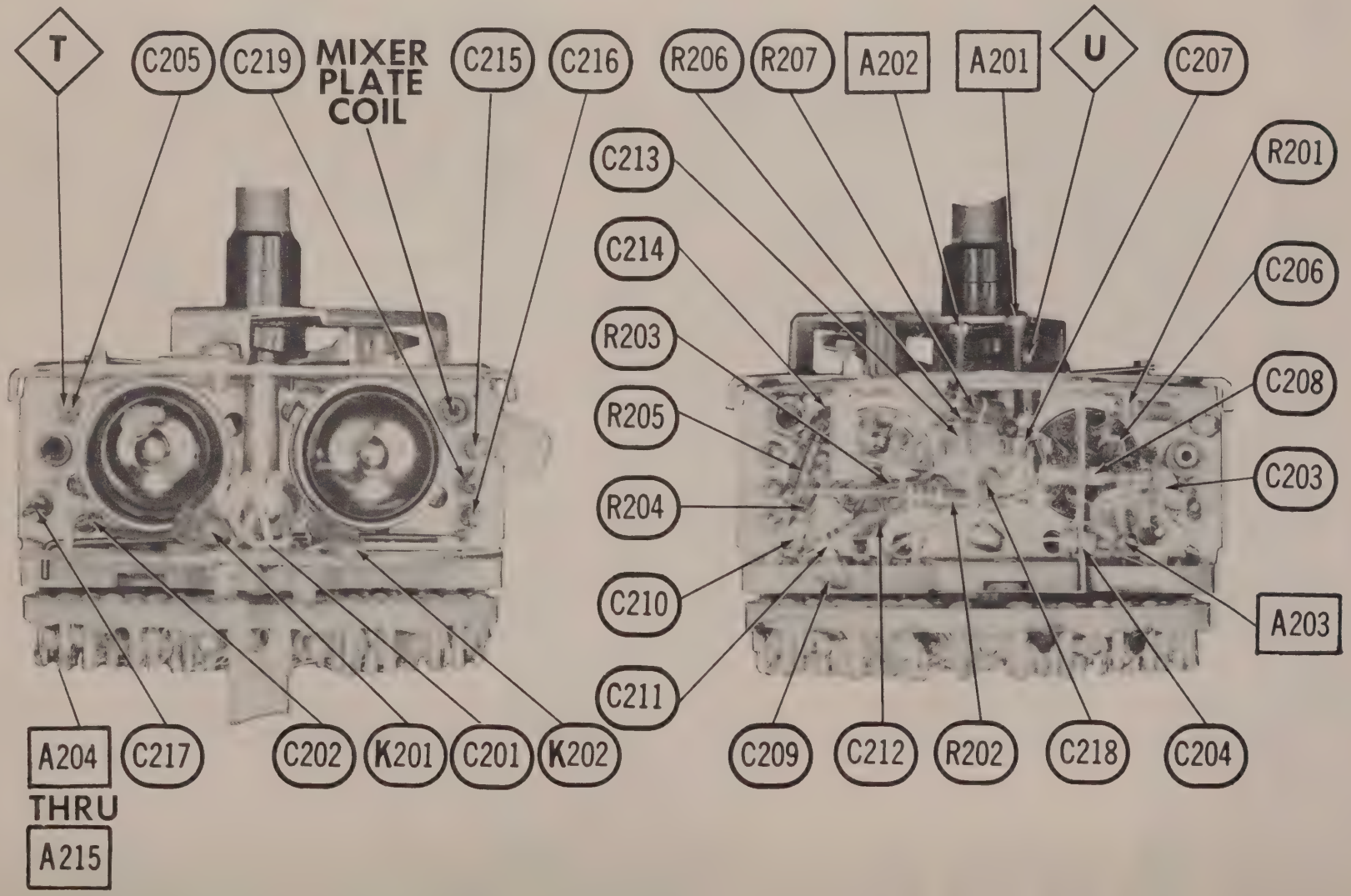
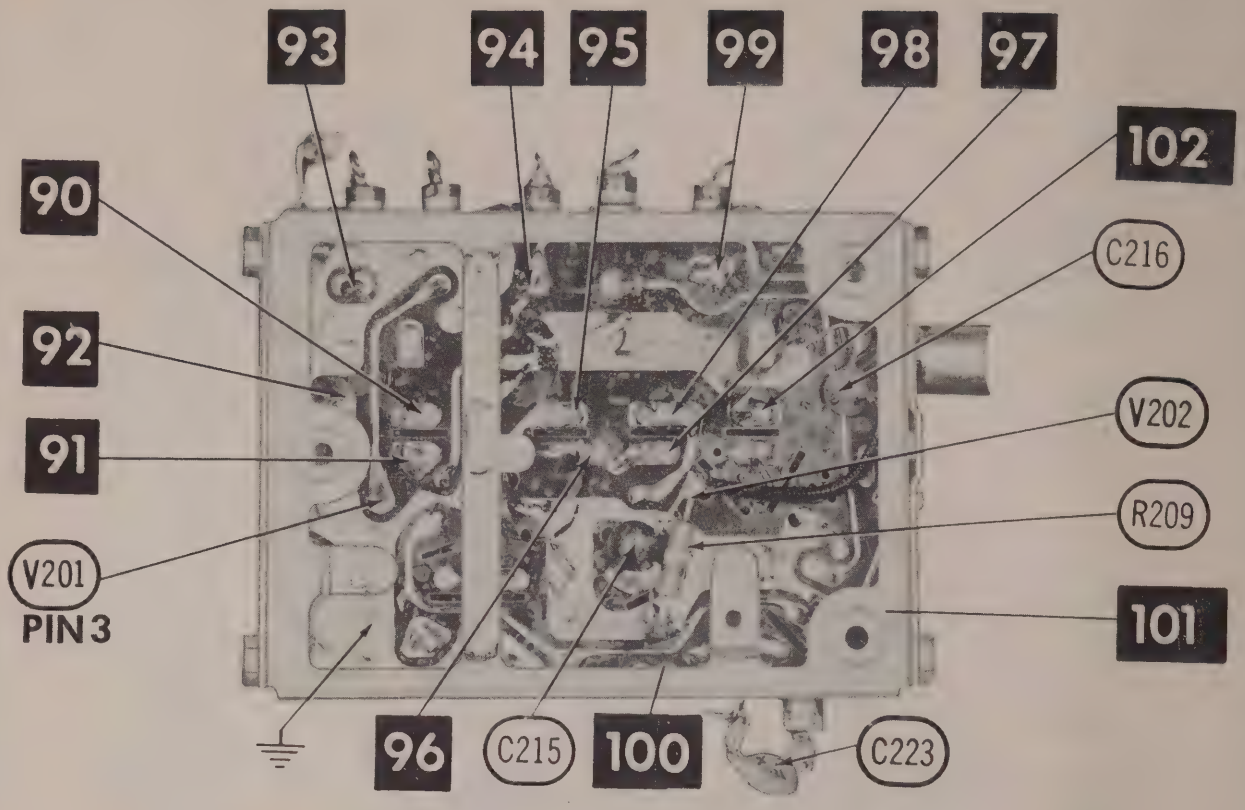


FIG. 202



TUNER 470V059H01

TUNER 470V057H01 - TOP VIEW



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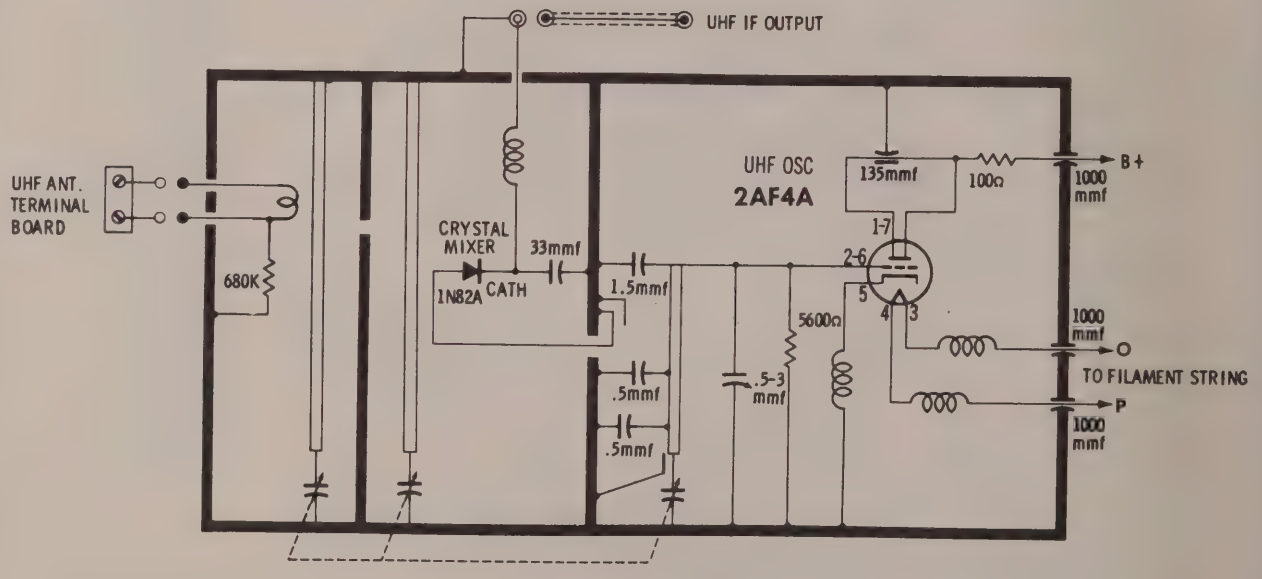
TUNER 470V057H01
BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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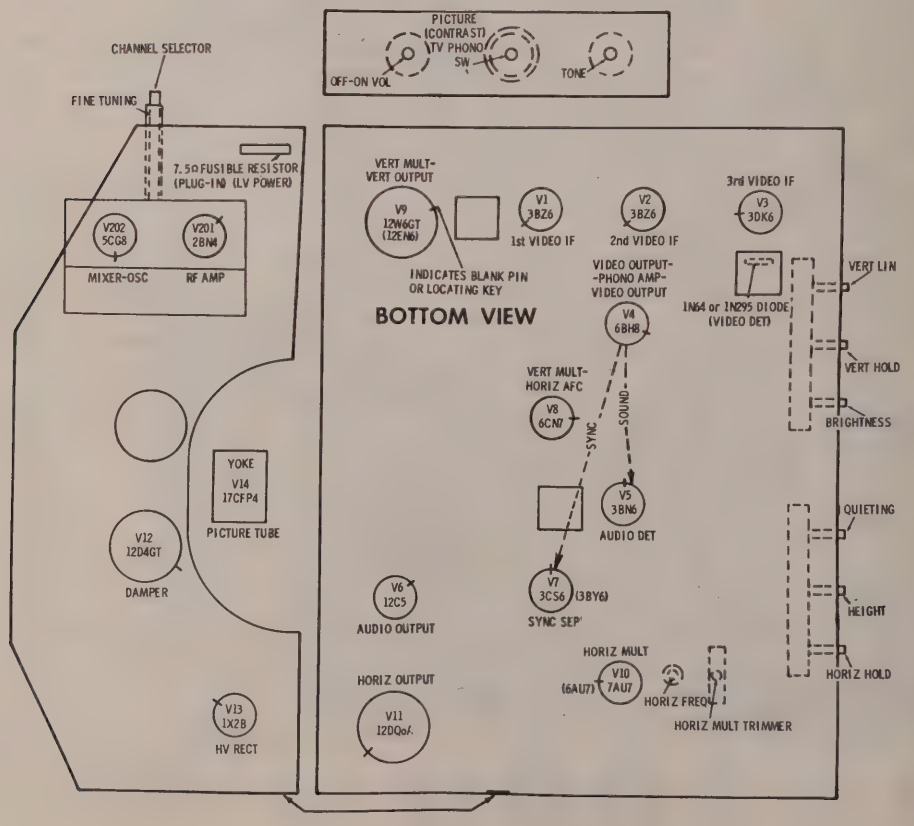
UHF TUNER 472V034H01

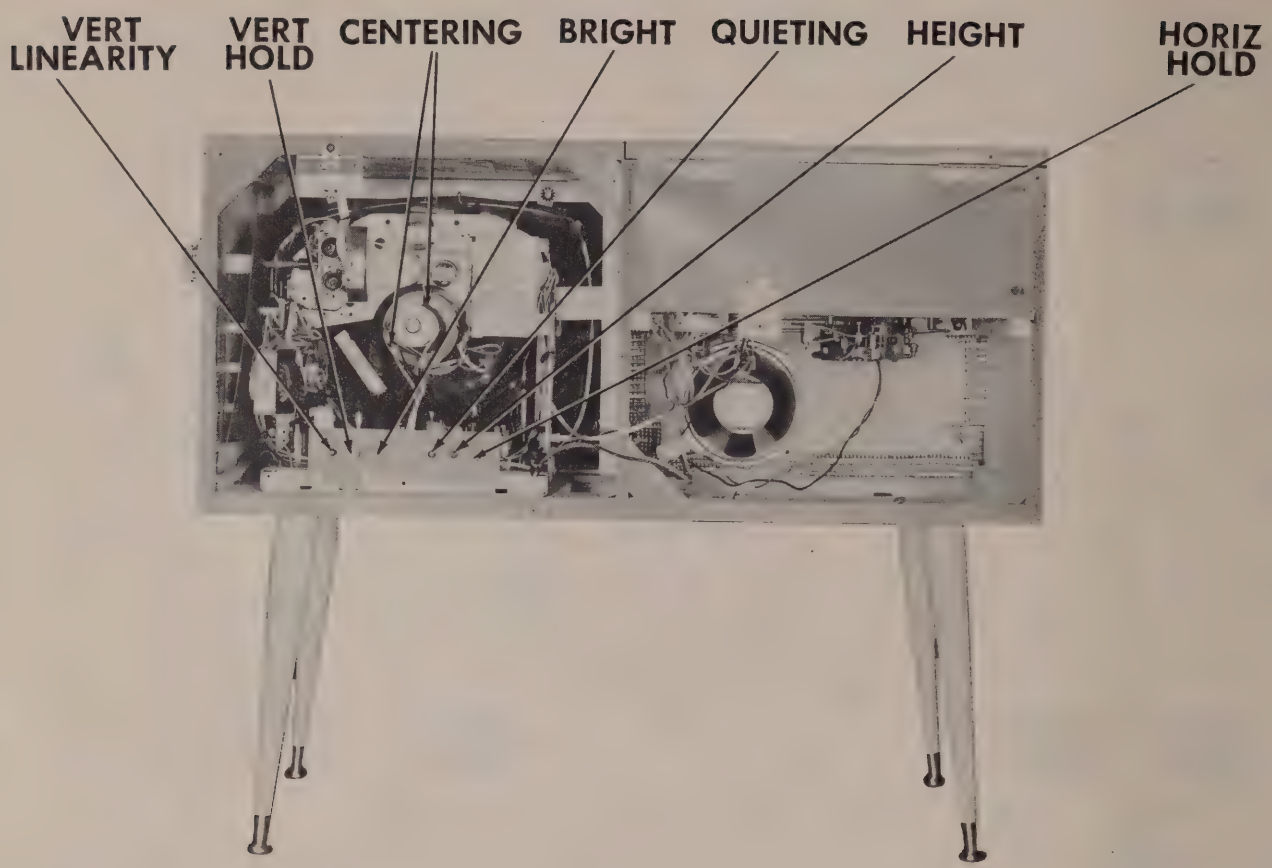
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	475K	47Ω	7.5Ω	7Ω	†650Ω	†650Ω	0Ω		
V2	3BZ6	480K	47Ω	7Ω	6.5Ω	†650Ω	†650Ω	0Ω		
V3	3DK6	.1Ω	150Ω	6.5Ω	5.5Ω	†650Ω	†650Ω	0Ω		
V4	6BH8	100Ω	10K	†5700Ω	2.5Ω	1Ω	150Ω	1meg	†180Ω	†5400Ω
V5	3BN6	1Ω	•30Ω	11.5Ω	11Ω	†8300Ω	6Ω	‡560K		
V6	12C5	180Ω	0Ω	12.5Ω	15Ω	0Ω	†1200Ω	†430Ω		
V7	3CS6	27K	0Ω	11.5Ω	12.5Ω	†35K	†7000Ω	2.5meg		
V8	6CN7	0Ω	1.7meg	680K	0Ω	0Ω	0Ω	• 1meg	• ‡5.7meg	1Ω
V9	12W6GT	NC	11Ω	†140Ω	†180Ω	•1.4meg	NC	7.5Ω	0Ω	
V10	7AU7	‡250K	• 240K	1500Ω	19Ω	19Ω	†39K	2.4meg	1500Ω	18Ω
V11	12DQ6A	NC	15Ω	NC	†100Ω	470K	NC	18Ω	.4Ω	TOP CAP ‡19Ω
V12	12D4GT	NC	NC	¶400K	NC	†1.2Ω	NC	19Ω	22Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡755Ω
V14	17CFP4	2.5Ω	100K	Pin 6 †180Ω	Pin 10 ‡1meg	Pin 11 • 250K	Pin 12 4Ω			
V201	2BN4	0Ω	500K	5.5Ω	5Ω	†470Ω	0Ω	500K		
V202	5CG8	10K	†5800Ω	0Ω	4Ω	5Ω	†2200Ω	†180Ω	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 140V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.
NC NO CONNECTION.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the Horizontal Frequency coil (L15).

Set the Horizontal Hold to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of Horizontal Multivibrator. Common to chassis.

With the receiver tuned to a TV signal, adjust the Horizontal Multivibrator Trimmer (B1) for zero reading on the VTVM. If zero can be approached, but not quite reached at one extreme of B1, it may be necessary to set the Horizontal Hold SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L15.

Adjust the Horizontal Frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.

PHOTOFACT* Folder

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 395

Admiral Models P17D21, P17D22, P17D23, P17D24 (Ch. 16F1), PA17D21, PA17D22, PA17D23, PA17D24 (Ch. 16AF1) were covered in PHOTOFACT Folder 1 - Set 395.

Late in production many new models and chassis were added along with the late production changes. Following is a complete list of all models and chassis used in each.

MODELS	CHASSIS	PICTURE TUBE
P14D11	16H1	†14ASP4 or 14AVP4
P14D12	16H1	†14ASP4 or 14AVP4
P14D13	16H1	†14ASP4 or 14AVP4
P14D14	16H1	†14ASP4 or 14AVP4
P17D21	16F1	17BZP4
P17D22	16F1	17BZP4
P17D23	16F1	17BZP4
P17D24	16F1	17BZP4
P17D46	16X1	17BZP4
P17D47	16X1	17BZP4
PA14D11	16AH1	†14ASP4 or 14AVP4
PA14D12	16AH1	†14ASP4 or 14AVP4
PA14D13	16AH1	†14ASP4 or 14AVP4
PA14D14	16AH1	†14ASP4 or 14AVP4
PA17D21	16AF1	17BZP4
PA17D22	16AF1	17BZP4
PA17D23	16AF1	17BZP4
PA17D24	16AF1	17BZP4
PA17D41	16AX1	17BZP4
PA17D42	16AX1	17BZP4
PA17D43	16AX1	17BZP4
PA17D44	16AX1	17BZP4
PA17D45	16AX1	17BZP4

† Use same type picture tube as found in set.

ADMIRAL CHASSIS 16AF1, 16AH1, 16AX1, 16F1, 16H1, 16X1

Ch. 16H1, 16AH1, 16AX1

COMPONENT CHANGES

A 14AVP4 (picture tube) may be used in any of the 14" models.

A 14ASP4 (picture tube) is used only in models having mounting brackets provided for it.

The 14ASP4 and 14AVP4 are electrically and physically identical except the 14ASP4 has a larger aquadag area.

M1 and M2 (Selenium Rectifiers) are used only in Ch. 16F1, 16X1, 16AF1 and 16AX1.

Two plug-in type 500 MA Silicon Rectifiers are used in the 16H1 and 16AH1 chassis.

V12 (Damper) is changed from 19AU4 to a 12AX4.

(Continued on Reverse Side)

PRODUCTION CHANGE
BULLETIN 221

PRODUCTION CHANGE
BULLETIN 221

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 446 FOLDER 3

Ch. 16H1	COMPONENT CHANGES C23 is increased from 300mmf @ 500V (ceramic) to 1000mmf @ 1600V (ceramic). R9 is increased from 470Ω 2W to 1800Ω 2W.
Ch. 16H1, 16X1, 16AX1	COMPONENT CHANGES A 120K ½W resistor is added in series with pin 3 of V14 (Picture Tube) to junction of R36, R37 and C65. A 120K ½W resistor is added in series with pin 4 of V14 (Picture Tube) to junction of R36, R37 and C65. R13 is increased from 7.5meg ½W to 10meg ½W. R46 is decreased from 220K ½W to 100K ½W. C8 is increased from 15mmf NPO 5% to 18mmf NPO 5% @ 600V. R97 (470K) and C75 (.005mfd) are removed from the printed circuit board. A 470K resistor paralleled by two 10000mmf capacitors in series, is added from cabinet ground to chassis ground.
Ch. 16X1	COMPONENT CHANGES C56 (.022mfd @ 600V) is changed to a .22mfd @ 200V (molded). C41 is increased from 10000mmf to .1mfd @ 400V. R59 is decreased from 270K ½W to 47K ½W. R7 (Super Range Finder, 100K) is added.
Ch. 16AX1	COMPONENT CHANGES R7 (Super Range Finder) is omitted.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 392

PACKARD-BELL MODELS 21SC6, 21SC7, 21SC8, 21SC9, 21SC11, 21SC12, 21SK3, A, 21ST3, 21ST4, 21VT2, 21VT3, 24SC2, 24SC3, 24ST4, 24VT1 (CH. 88S3, 88S4)

Packard-Bell Models 21SC6, 21SC7, 21SC8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1 (Ch. 88S3) were covered in PHOTOFACT Folder 2 - Set 392.

Models 21SC9, 21SC11, 21SC12, 21SK3A, 21ST4, 21VC5, 21VT3, 24SC3, 24ST4 (Ch. 88S4) are added, along with late production changes with the publication of this bulletin.

Model 21SK3

TO IMPROVE AUDIO RESPONSE

C25 is omitted.

Two 100K resistors in series have been added from the junction of R37 and the right hand terminal of R1B to ground.

TO PROTECT PICTURE TUBE WHEN SWITCHING FROM TV TO RADIO

L13 (Horiz. Osc.) in combination models is Part #29698A.

A 10mfd @ 350V capacitor is added from the junction of R84 and B+ to ground.

TO INCREASE BRIGHTNESS

R31 is decreased from 100K 1W to 82K 2W.

TO ELIMINATE RF FEEDBACK TO TUNER

A .01mfd capacitor is added from the junction of R2, R31, R30 to ground.

TO REDUCE AM INTERFERENCE

C5, originally mounted on a terminal board on the chassis, is moved to the tuner and connected from the AGC terminal to ground.

PICTURE TUBE CHANGED

V17 is a 21CBP4A or 24AEP4 and does not require an Ion Trap.

COMPONENT CHANGES

T4 (Horiz. Output Trans.) is changed to Part #89486B.

V15 is changed from a 1B3 to 1G3.

L13 (Horiz. Osc.) is changed to Part #29699.

L13 (Horiz. Osc.) in combination models use Part #29702.

(Continued on Reverse Side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 393

MOTOROLA MODELS Y21K90CW, 21K90CW (CH. TS-544, Y)

Motorola Models 21F8B, W, WA, 21K73B, M, 21K75B, CW, M, 21K76B, CW, M, 21K77B, M, 21K80CW, CWA, 21T40BG, MG, 21T42B, M, 21V1W, WA (Ch. TS-544), Y21F8B, BA, W, WA, Y21K73B, BA, M, MA, Y21K75B, BA, CW, CWA, M, MA, Y21K76B, BA, CW, CWA, M, MA, Y21K77B, M, Y21K80CW, CWA, Y21T40BG, BGA, MG, MGA, Y21T42B, BA, M, MA, Y21V1W, WA (Ch. TS-544Y), 21K81B, M (Ch. WTS-544), Y21K81B, M (Ch. WTS-544Y) were covered in PHOTOFACT Folder 2 - Set 393.

Model 21K90CW (Ch. TS-544) and Model Y21K90CW (Ch. TS-544Y) are electrically identical except for the changes given in this bulletin.

COMPONENT CHANGES

TS-544-A-11 — K1, or an individual 5800Ω resistor and 500mmf capacitor in series with pin 2 of V6 (Video Output) and L23 are omitted. With this change L25 is connected directly to pin 2 of V6.

TS-544-A-13 — T1 (Power Transformer) is changed to Part #25D745778 with heat dissipating fins and is electrically identical to previous part #25D743311, but is not interchangeable due to mounting differences.

TS-544-A-13-1 — When replacing T1 (Power Transformer) order exact replacement for type found in the chassis.

The suffix "-1" following the regular chassis coding indicates a revision of the power transformer to the type preceding coding change A-13.

Ch. 88S3	PICTURE TUBE CHANGED V17 (Picture Tube) is changed from 21BTP4 or 24DP4A/24YP4 to 21CBP4A or 24AEP4 and does not require an Ion Trap.
Ch. 88S4	TO ELIMINATE PARASITIC OSCILLATION A 47mmf 10% capacitor is added in parallel with R56. TO MINIMIZE RADIATION A .01mfd capacitor is added from the shield of the audio cable to ground. TO IMPROVE STABILITY OF SOUND IF The tolerance of C22 is changed from 20% to 10%. TO REDUCE HIGH FREQUENCY RESPONSE C31 is increased from .0047mfd to .01mfd. TO STABILIZE HORIZONTAL SWEEP R78 is decreased from 2200Ω 10% to 2000Ω 5%. Chassis incorporating this change are coded 1828 or higher. TO REDUCE WIDTH C66 is omitted. When C66 is not used, the brown wire from terminal 7 of the yoke is connected to terminal 2 of T4 (Horiz. Output Trans.). C64 is increased from .047mfd to .1mfd @ 600V.

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER

ADMIRAL MODELS 4L21, 24, 25, 26, 28, 4M22, 23, 25, 28, 251 (Ch. 4L2, 4M2)

ADMIRAL MODELS 4L21, 24, 25, 26, 28, 4M22, 23, 25, 28, 251 (Ch. 4L2, 4M2)

MODEL 251

ADMIRAL MODELS 4L21, 24, 25, 26, 28, 4M22, 23, 25, 28, 251 (Ch. 4L2, 4M2)

TRADE NAME	Admiral Models 4L21, 4L24, 4L25, 4L26, 4L28 (Ch. 4L2); 4M22, 4M23, 4M25, 4M28, 251 (Ch. 4M2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	AC Operated 4 Tube AM Receiver (4L Series Models Are Not Clock Versions)
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	25 Watts, .27 Amp. @ 117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	535 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A3, A4.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 1 (grid) of 12AU6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A4	"

DISASSEMBLY

1. Remove volume and tuning knobs.
2. Remove 4 hex head screws from corners of cabinet back.
3. Remove screw behind tuning knob.
4. Remove screw holding AC interlock bracket.
5. Disconnect output transformer leads and clock leads (where applicable).
6. Remove chassis.
7. Remove knob from clock front.
8. Remove 4 clock mounting screws. Remove clock.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J45

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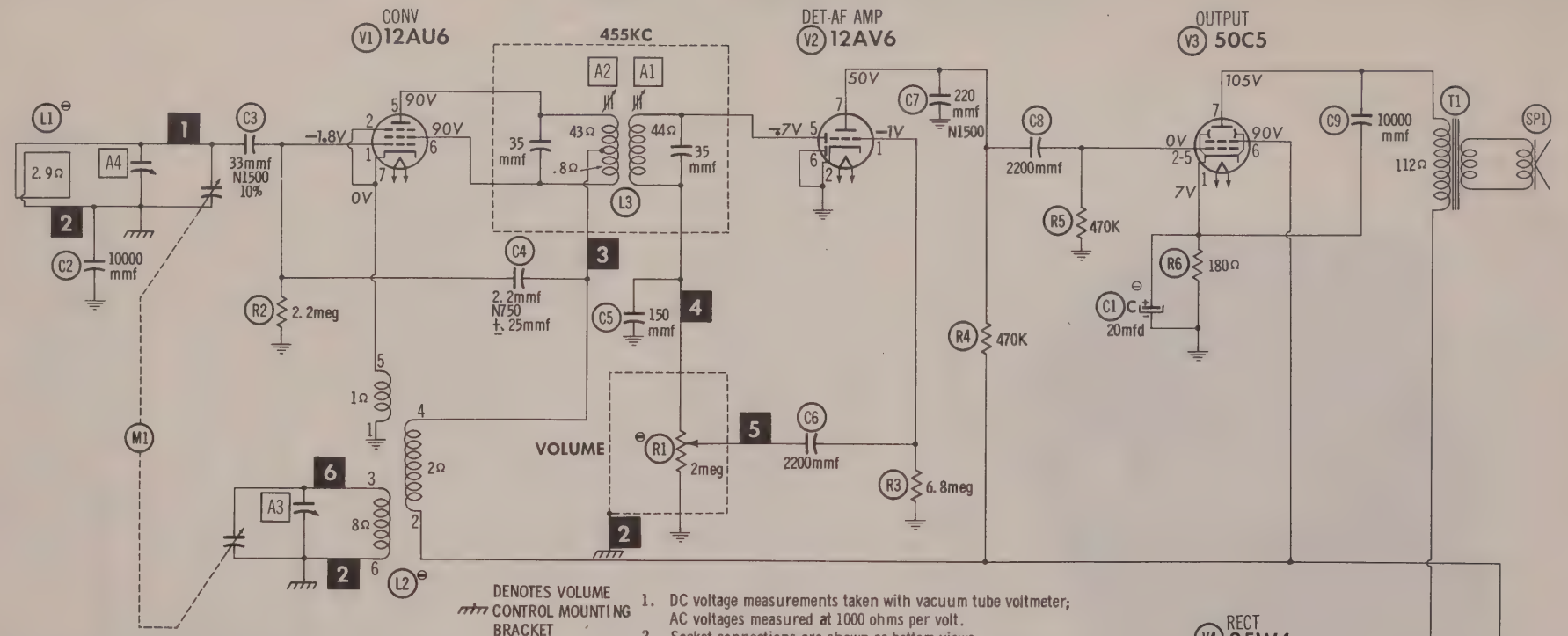
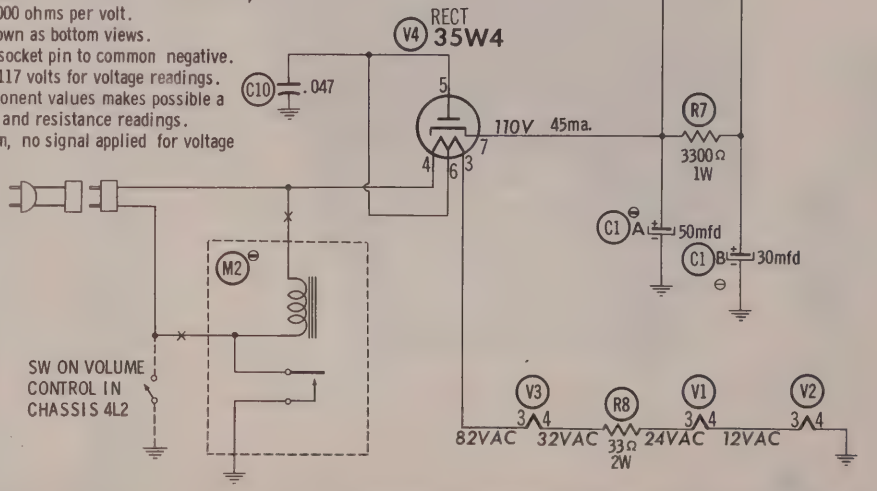
SET 446 FOLDER 4





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DENOTES VOLUME CONTROL MOUNTING BRACKET

OSC. COIL BOTTOM VIEW

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2meg	1Ω	24Ω	12Ω	†3300Ω	†3300Ω	1Ω
V2	12AV6	6.8meg	0Ω	12Ω	0Ω	2meg	0Ω	†470K
V3	50C5	180Ω	470K	107Ω	57Ω	470K	†3300Ω	†112Ω
V4	35W4	NC	NC	107Ω	140Ω	120Ω	120Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*

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ADMIRAL MODELS 4L21, 24, 25, 26, 28, 4M22, 23, 25, 28, 251 (Ch. 4L2, 4M2)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det. - AF Amp.	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	67C39-4 ①	PRS150/25V	BBRT5315C	TCT3107	TDLT-15	VLS-3430 *	
B	30	150		5030/20					
C	20	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use Part #67C30-3.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000			65D10-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C3	33		N1500 10%	65D10-119		TCL-33				
C4	2.2		N750 ±.25mmf	65D10-27						
C5	150			65D10-85	BPD-00015	DD-151	L10T15	B-315	5GA-T15	
C6	2200			65D10-89	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C7	220		N1500	65D10-21						
C8	2200			65D10-89	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C9	10000			65D10-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	.047	400		64B17-28	P488N-047	DF-503	PJ4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	75D25-7 ①	B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

① Chassis 4L2 uses Part #75C25-6 (with switch).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R2	2.2meg		60B8-225	
R3	6.8meg		60B8-685	
R4	470K		60B8-474	
R5	470K		60B8-474	

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R6	180Ω		60B8-181	
R7	3300Ω	1	60B14-332	
R8	33Ω	2	60B20-330	

COILS (RF-IF)

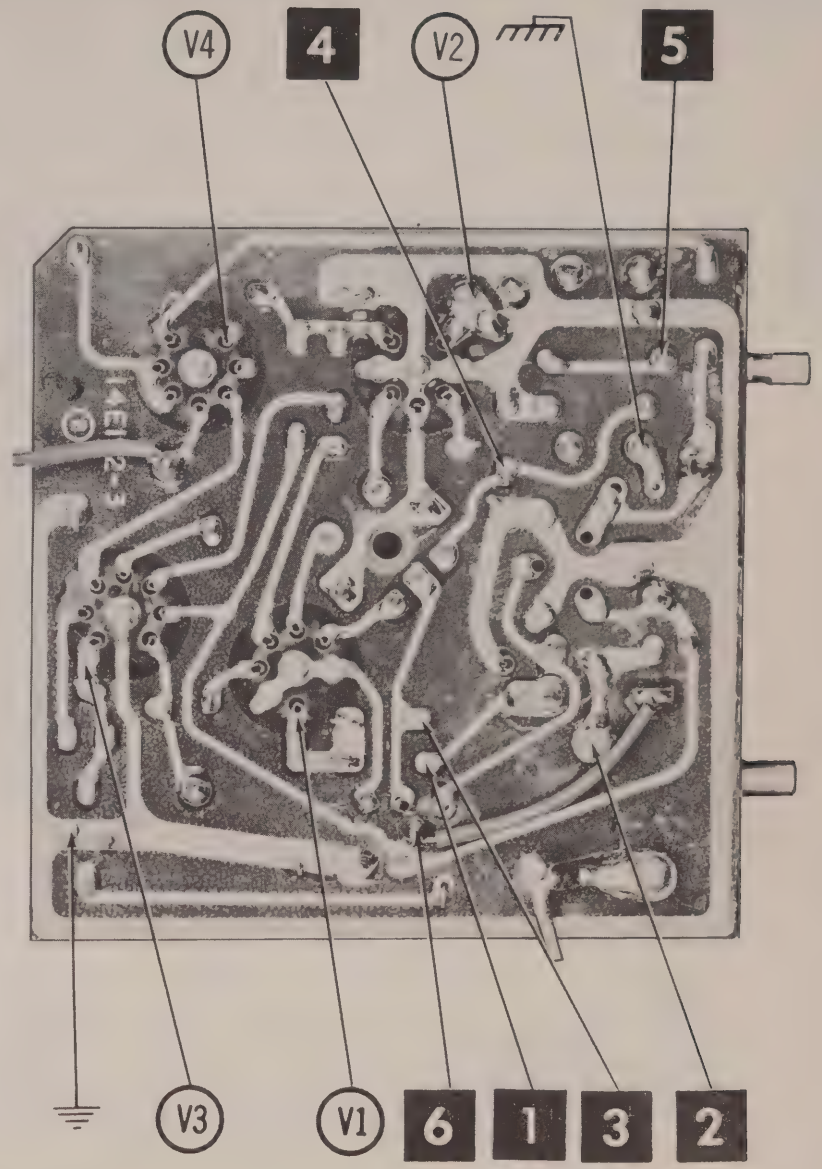
ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	69C212-1 †						
L2	Osc. Coil	69A215-3 *						
L3	IF Trans.	72C175						

† Part #69C212-2 used in Models with suffix letter "N". * Replaces Part #69A215-1 & 69A215-2 used in early versions.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (cont)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-4Ω	Part of SP1	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78B94-1 ①	4A07	① Includes T1

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Cap.	26B64-3	2 Gang, Ant. 354mmf Max., Osc. 89.3mmf Max.
M2	Clock	91C23-1	Complete, Model 251
	Clock	91C14-1	Complete, Models 4M Series
	Printed Board	14E192-3	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

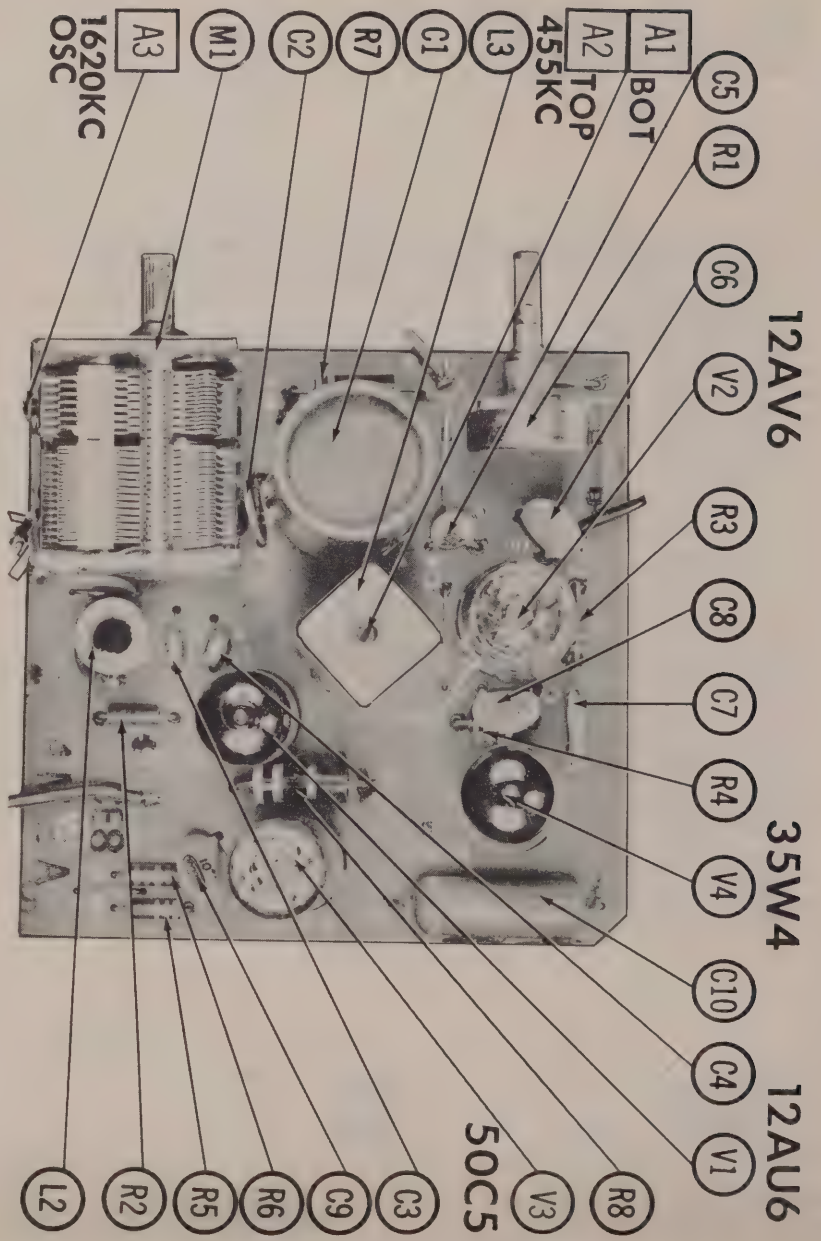
NAME	PART NO.	DESCRIPTION
Knob	33C197-1	Tuning, Model 251
Knob	33C133-19	Tuning, Models 4L21, 4L24, 4L25, 4L26, 4L28, 4M22, 4M23, 4M25, 4M28
Knob	33C133-3	Tuning, Maroon, Models 4M22, 4M23, 4M25, 4M28
Knob	33C197-2	Volume, Model 251
Knob	33C133-20	Volume, White, Models 4L21, 4L24, 4L25, 4L26, 4L28, 4M22, 4M23, 4M25,
Knob	33C133-4	Volume, Maroon, Models 4M22, 4M23, 4M25, 4M28 4M28
Knob	91C23-10	Clock, Model 251
Knob	91C14-11	Clock, Maroon, Models 4M22, 4M23, 4M25, 4M28
Knob	91C14-16	Clock, White, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D106-2	Ebony, Model 251
Cabinet	34D111-1	Ebony, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D111-6	Green, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D111-3	Pink, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D111-4	Red, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D111-5	Yellow, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D111-2	White, Models 4L21, 4L24, 4L25, 4L26, 4L28
Cabinet	34D78-13	Beige, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D78-12	Coral, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D78-1	Ebony, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D78-14	Green, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D78-6	Ivory, Models 4M22, 4M23, 4M25, 4M28
Cabinet	34D78-2	Mahogany, Models 4M22, 4M23, 4M25, 4M28
Clock Crystal	24A20-2	Model 251
Clock Crystal	24A19	Models 4M22, 4M23, 4M25, 4M28

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



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ADMIRAL MODELS 581, 582 (Ch. 5W4)

ADMIRAL MODELS 581, 582 (Ch. 5W4)

MODEL 581

TRADE NAME	Admiral 581, 582 (Ch. 5W4)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	6 Volts DC
TUNING RANGE—BROADCAST	535 - 1620KC
RATING	9.5MA @ 6 Volts DC (No Signal, Min. Volume) 11.5MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A3..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

A4 and A5..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

A6..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

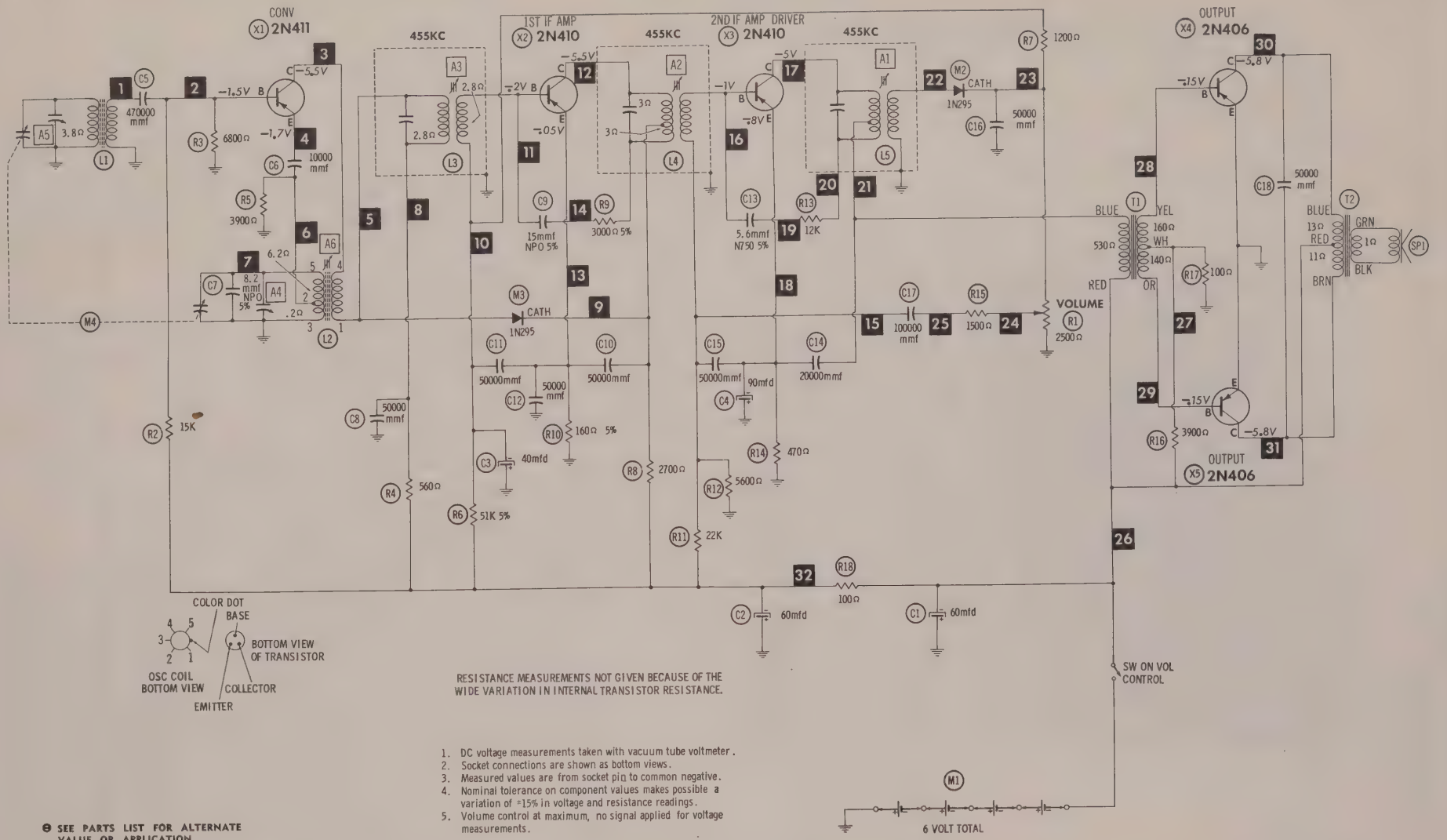
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A4	Adjust for maximum output. Repeat step 1.
3.		"	1400KC	Tune in 1400KC signal	"	A5	Adjust for maximum output.
	If receiver will not cover entire range, proceed with Step 4.						
4.		Loop	535KC	Tuning gang fully closed	Across voice coil	A6	Set A4 1/4 turn from tight and adjust A6 for maximum output. Repeat step 2 and 4.

DISASSEMBLY

1. Remove battery compartment cover. Remove batteries.
2. Remove 2 Phillips screws from bottom of battery compartment.
3. Remove tuning knob.
4. Remove Phillips screw at left of tuning shaft.
5. Remove cabinet front.
6. Remove 2 other Phillips screws from battery compartment.
7. Close tuning gang. Remove 2 Phillips screws, one near gang, the other from lower left corner (radio viewed from front).
8. Lift speaker out. Lift chassis out.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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ADMIRAL MODELS
581, 582 (Ch. 5W4)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411	Converter		2N411	2N486	2N411	PNP
X2	2N410	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2N410	2nd IF Amp. -Driver		2N410	2N483	2N410	PNP
X4	2N406	Output		2N406	2N633	2N406	PNP } Matched
X5	2N406	Output		2N406	2N633	2N406	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	60	6	67B32-8	XPP-6060	ECPA115	PET1260	ML50-6	VL-1094	
C2	60	6	67B32-8	XPP-6060	ECPA115	PET1260	ML50-6	VL-1094	
C3	40	3	67B32-9	PWE3040	ECPA14	PET140	ML40-6	VL-1045	
C4	90	3	67B32-10	PWE3100	ECPA17	TT3X110	ML100-3	VL-1051	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	470000			65B45-16						
C6	10000			65D10-41	BPD-01	DM-103	BYA10S1	TA-110	TG-S10	
C7	8.2		NPO 5%	65D10-131						
C8	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C9	15		NPO 5%	65D10-143		DTZ-15		CNO-415		
C10	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C11	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C12	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C13	5.6		N750 5%	65D10-176					5TCCB-V56S 5%*	
C14	20000			65B45-4	BPD-02	DA-203		TA-120	TG-S20	
C15	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C16	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	
C17	100000			65B45-15						
C18	50000			65B45-6	BPD-05	DA-503		TA-150	TG-S50	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	½	75B36-1					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R2	15K		60B8-153	
R3	6800Ω		60B8-682	
R4	560Ω		60B8-561	
R5	3900Ω		60B8-392	
R6	51K 5%		60B7-513	
R7	1200Ω		60B8-122	
R8	2700Ω		60B8-272	
R9	3000Ω 5%		60B7-302	
R10	160Ω 5%		60B7-161	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R11	22K		60B8-223	
R12	5600Ω		60B8-562	
R13	12K		60B8-123	
R14	470Ω		60B8-471	
R15	1500Ω		60B45-152	
R16	3900Ω		60B8-392	
R17	100Ω		60B8-101	
R18	100Ω		60B8-101	

PRINTED BOARD

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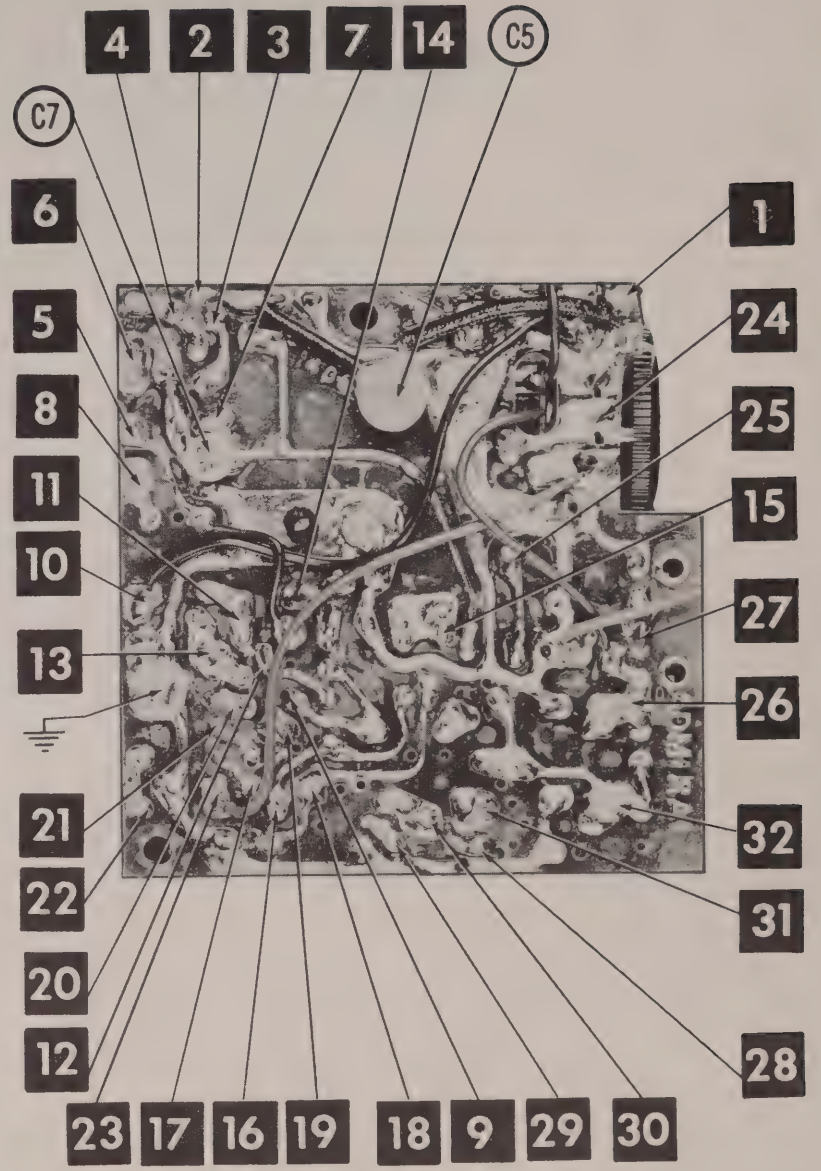


PARTS LIST AND DESCRIPTIONS (Con't)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	69C218-4						
L2	Osc. Coil	69B232-1						
L3	1st IF Trans.	72C182-8						
L4	2nd IF Trans.	72C182-9	16-9008*	16-9008*				* Remove lugs
L5	3rd IF Trans.	72C182-10						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	79B67-3						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	450Ω CT	15Ω	79D68-4	TR-18			TA-21	TR-18		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	2 3/4"	PM	15Ω	78B125-1		

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V			Z ①		915 ① E9 ②		M-15R① ZM9 ②	① 4 Used ② Mercury Type, use 4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295	1N295	1N60	1N295	Detector (Pigtail)
M3	1N295	1N295	1N60	1N295	Overload (Pigtail)

MISCELLANEOUS

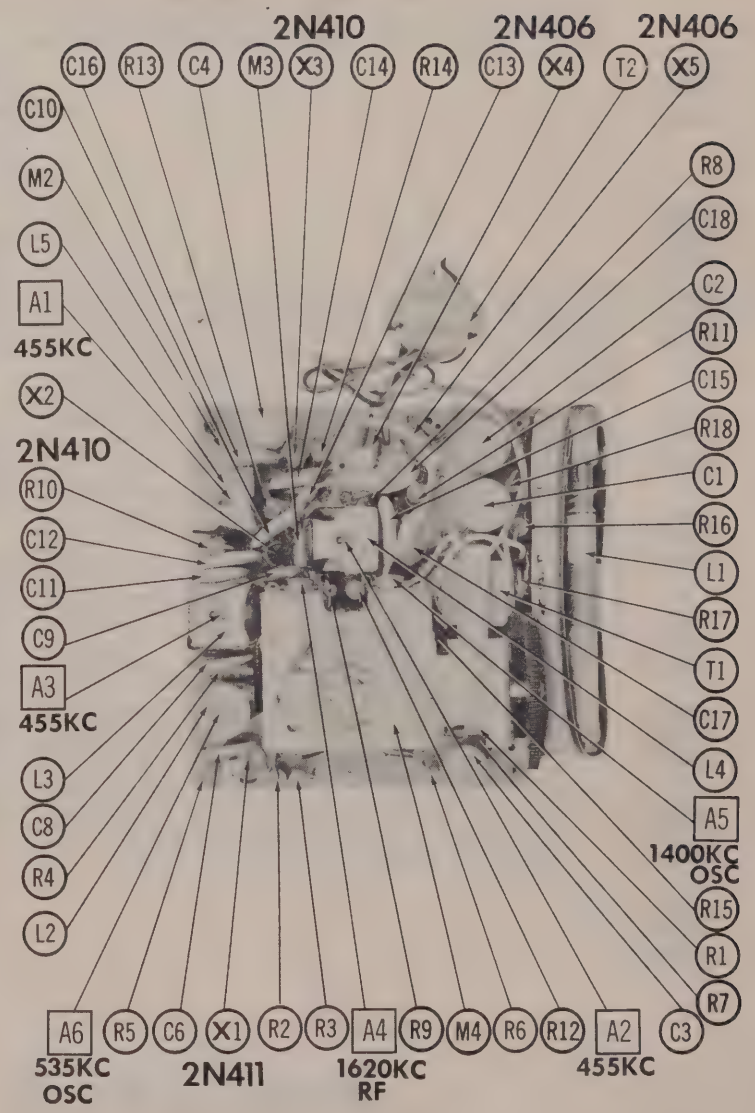
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap. Printed Board	68B67-2 140201-5	2 Section, Ant. 123.1mmf max, Osc. 78.2mmf max.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33D300-3	Tuning
Knob	33C217-2	Volume-On-Off
Cabinet Front	34E115-14	Black
Cabinet Front	34E115-15	Red
Cabinet Back	A7181	Assembly, Black
Cabinet Back	A7182	Assembly, Red

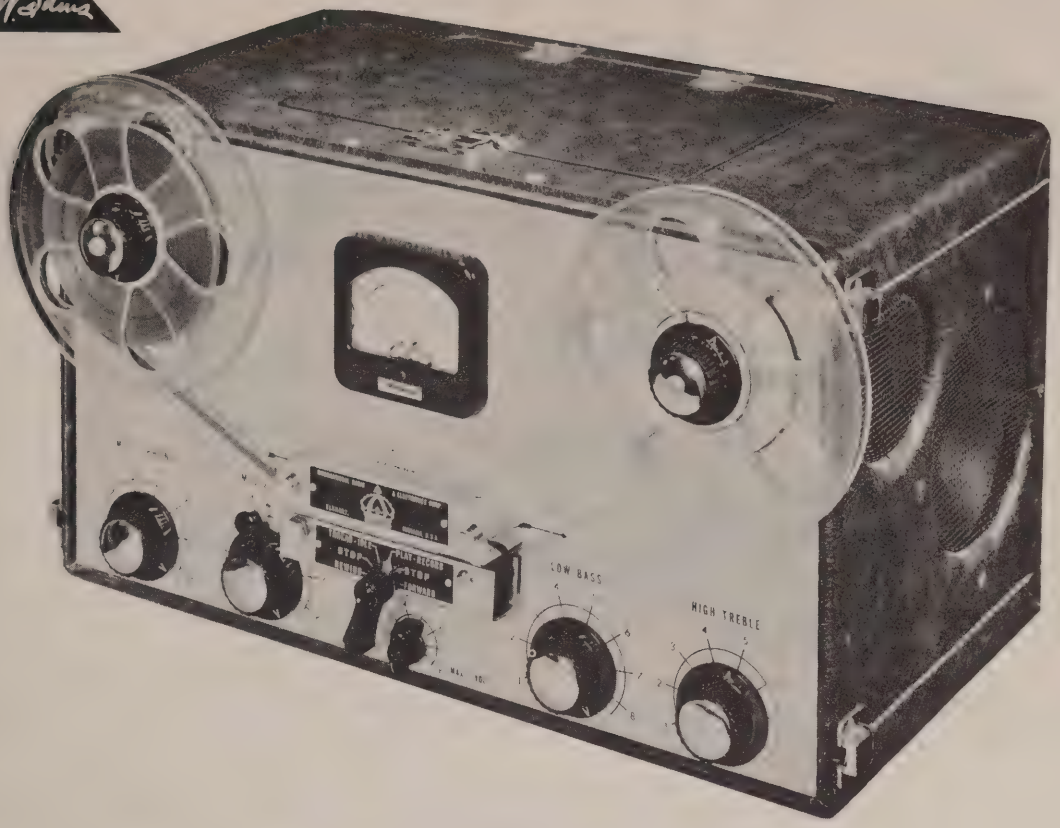
CHASSIS—TOP VIEW



WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

PHOTOFACT* Folder



CROWN
MODEL Imperial

CROWN
MODEL Imperial

GENERAL INFORMATION

Crown Imperial tape recorders consist of two sections, the tape transport and the amplifier.

The tape transport and the amplifier are assembled on a steel plate. The complete assembly is then mounted in a portable carrying case. All mechanical and electrical functions necessary for the operation of the tape drive are self-contained.

The amplifier contains all the elements necessary for supplying the erase and record heads of the recorder with power and for amplifying the signal from the playback head. The recorder output is the push-pull type. Cathode-follower output is also provided for use with an external amplifier.

The tape transport accommodates all sizes of reels up to and including the standard NARTB 10 1/2-inch reel. In addition, 15-, 7 1/2-, and 3 3/4-ips tape speeds, with correction of equalization, can be selected.

Manufactured by:
International Radio and Electronics Corporation
Elkhart, Indiana

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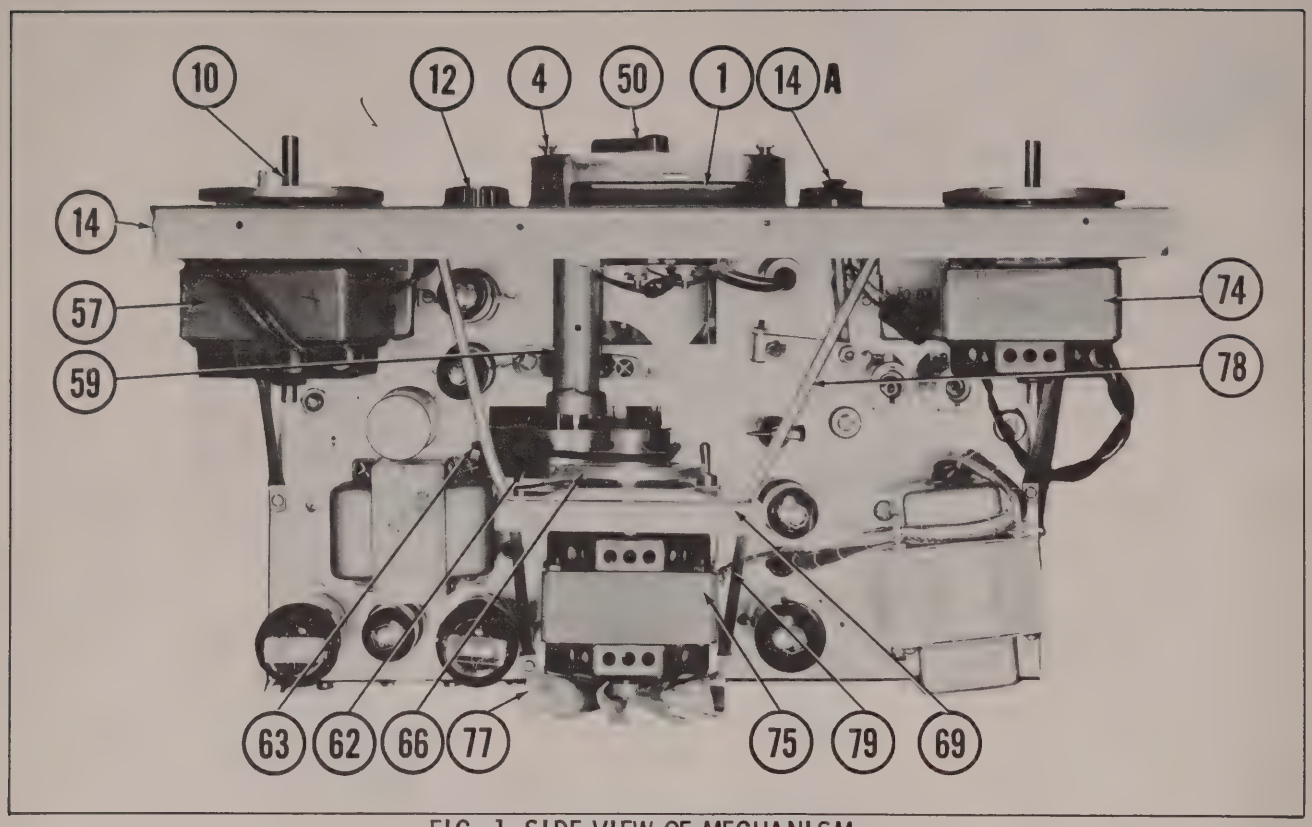


FIG. 1 SIDE VIEW OF MECHANISM

SPECIFICATIONS

Heads:

Full track or stereo in-line, optional.

Power:

160 watts, 115 volts, 60 cycles AC.

FUNCTION OF CONTROLS, SWITCHES, AND INDICATORS

Microphone #1 Gain

Varies the gain of the microphone #1 input.

Microphone #2 Gain

Varies the gain of the microphone #2 input.

Playback Volume

Controls the volume of playback.

Low Bass

Varies the low frequency of playback.

High Treble

Varies the high frequency of playback.

Control Switch

Controls the tape movement. This knob has six clearly-marked positions. The Thread-Idle position is at the left center; always place the knob in the Thread-Idle position when the recorder is not being used. The next position is the Stop, then Rewind position. Be sure to pause in the Stop position long enough to allow the tape to stop completely before reversing the direction of the tape. The Play-Record position is next at the right.

NOTE: Never leave the Control Switch knob in the Play-Record position when the recorder is not being used because flat spots will be produced on pressure roller (28). These flat spots later may cause wow and flutter.

The Stop and Forward positions are next. The Forward position quickly reels the tape when the operator is cueing or looking for a special number on the tape. Be sure to pause long enough in the Stop position to allow the tape to stop completely.

Play-Record

Places the amplifier in Record or Play position: push in for Play, pull out for Record.

Jacks

Three inputs: two microphone and one phono high-impedance.

Four outputs: three speaker outputs (4, 8, and 16 ohms) and cathode-follower output at rear of unit.

VU Meter

For recording level indication.

Threading Tape

1. Place a reel on left reel flange and an empty reel on right reel flange; make sure reel slots engage flange pins on reel flange.

2. Unwind about twelve inches of tape from the reel. Hold a section of tape taut with both hands and insert the tape into the tape slot; make sure the dull-coated side of the tape faces the heads.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns counterclockwise until the tape is secured to the reel and all slack is taken up between reels.

To Make a Recording

1. Thread tape as described under "Threading Tape."

2. Turn the amplifier controls to the left (minimum) position.

3. Plug the power cord into the receptacle at the rear of the unit and into a 117-volt, 60-cycle AC source.

4. Turn the On-Off-Volume control to On and allow the recorder to warm up for at least five minutes.

5. Push in the Record-Play button to the Record position indicated by the red light in the VU meter.

6. Insert the microphone plug into the microphone jack at the rear of the unit. Do not plug in the microphone or phonograph when the Microphone Gain control is turned up. Always turn the Microphone Gain controls to their minimum positions to prevent damage to the equipment.

7. Start the tape movement by snapping the Control knob to the Play-Record position.

8. Turn the proper Microphone Gain control until the VU meter indicates that the signal is at the proper recording level. Control the recording level with peaks of not more than 100 on the VU meter.

9. After the recording is completed, pull out the Play-Record button to the Play position then rewind the tape. Do not attempt to rewind the Tape when the Play-Record button is in Record.

To Play Back a Recording

1. Thread tape as described under "Threading Tape."

2. Turn the amplifier controls to the left (minimum) position.

3. Plug the power cord into the receptacle at the rear of the unit and into a 117-volt, 60-cycle AC source.

4. Turn the On-Off Volume control to On and allow the recorder to warm up for at least five minutes.

5. Make sure the Play-Record button is in the Play position and the red light in the VU meter is off.

6. Start the tape movement by snapping the Control knob to the Play-Record position.

7. Turn the On-Off-Volume control to the desired volume. Do not turn the volume to maximum.

Dual-Track Recording

Dual-track models record one-half the tape width at a time and thus permit dual-track recording. This two-track operation is as follows:

1. After a reel of tape has been recorded (i.e., all the tape has been wound onto the right reel), turn the Control knob to Stop.

2. Remove the reel from the recorder. Turn over the full reel and place it on the left reel flange; turn over the empty reel and place it on the right reel flange.

3. Thread the tape properly, and proceed with the recording.

4. After the second track has been recorded, the first track can be played, without rewinding, by reversing the reel as described in Step 2.

NOTE: Some models are full-track recorders; therefore, the dual-track recording explanation does not apply to them.

To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other track, recordings to be edited should be limited to one track only.

1. The tape can be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements, etc., can be inserted between selections. Unused sections of tape can be spliced for re-use.

2. For best results, cut tape at a slight diagonal, join ends with splicing tape on the glossy side, and trim any excess width.

Mixing Microphone and Phonograph Records

1. To record from both a phonograph and a microphone, set recorder as described under "To Make a Recording."

2. Insert the plug from a record player into Phono Input jack and adjust the volume with the volume controls on the tape recorder.

TAPE TRANSPORT OPERATION

Braking System

Electromagnetic braking is employed in this recorder and is accomplished by applying DC to the motors. When the unit is switched from Fast Forward to Stop, there are 9 volts DC on take-up motor (57) and 17 volts DC on rewind motor (74). When the unit is switched from Rewind to Stop, there are 9 volts DC on rewind motor (74) and 17 volts DC on take-up motor (57). DC for the brake voltage is furnished by selenium rectifier M1.

Switch Action of Switch Control

A six-position switch M10 operates the transport system. When the switch is operated, a deliberate snapping motion, rather than a squeezing motion, must be used. As long as the switch is moved one position at a time and the tape is allowed to stop completely in the Stop position, the switch will be easy to operate. A tape loop will be formed if the switch is moved too slowly from the Thread-Idle position to the Play-Record position.

Cam Action

The only time the tape contacts the heads is when the unit is in the Play-Record position. This action is accomplished by cam (50A) on the control switch shaft. Return spring (42) inner pressure bar (25) holds the bar away from the heads in all positions except Play-Record.

ADJUSTMENTS

Timing

If the tape is running too fast, socket head capscrew (47) under outer pressure bar (30) should be tightened a few turns. If the tape is running too slow, socket head capscrew (47) should be loosened a few turns. These adjustments are intended to be corrections for not more than ± 15 seconds in one-half hour. A spring tension of not less than four pounds should be maintained on pressure roller (28) to pull the tape between pressure roller (28) and the capstan.

Heads

The heads are mechanically and electrically prealigned at the factory. The following instructions are given should the alignment need rechecking. Before starting, demagnetize all tools which might contact the head assembly to avoid magnetizing the heads. In a dual-track recorder, erasure and recording is done on the front half of the tape. A plastic transparent straight edge will make the checking of the head positioning much easier. With the head assembly removed from the recorder, measure the distance from the panel of the recorder to the edge of pressure pads (24B). This distance should measure 17/32" for both pads. If necessary, pressure pad spring (24) can be moved by loosening screws (20).

After the pressure pads are properly adjusted, place the head assembly on the recorder; make sure the pads are seating properly against the heads. Remove upper name plate (3). Connect a VTVM or oscilloscope to the recorder output, and play a 10,000-cycle alignment tape. Set the playback controls to a nominal amount, and note the position of all head alignment screws (5). Then align with right screw only, noting how far it is moved. If this screw must be moved (for instance, one and one-half turns to the right for proper electrical alignment), it should then be turned to the left one-quarter turn; the two left alignment screws should also be turned one-quarter turn to the left to maintain proper mechanical alignment. Adjust the head to give maximum output, but leave the gain controls fixed.

Bias Adjustment

An audio generator and a sensitive VTVM capable of measuring variations accurately in the range of 0 to 2 volts at 70 to 75 kc are required. Connect a 1,000-ohm resistor in series with the ground side of the record head. Connect the VTVM across the resistor.

With the recorder in the Record position, adjust bias oscillator slug A1 for VTVM reading of 1.9 volts for full width and .55 volt for half width and series "A" recorders. Check distortion at full record level with 400 cycles, as indicated on the record level meter when the unit is in the Play-Record position. An indication of less than 2% should be obtained.

MAINTENANCE

Lubrication

All moving parts of the recorder mechanism operate in lubricated oilite bearings; therefore, little oil is required. The motors, pressure roller bearing, and speed shift idler bearing should be oiled lightly after 1,000 hours of operation or one year. Bearing housing assembly (59) should be oiled after 3,000 hours of operation. If any oil seeps to the outer edge of the moving parts and causes slippage in the drive mechanism, wipe all affected parts with a clean, soft cloth and carbon tetrachloride. For lubrication, Bardahl Sinclair or an equivalent household oil is recommended.

CAUTION: Do not overlubricate.

Cleaning

Excessive oil or dirt on moving parts should be removed with a clean, soft cloth and carbon tetrachloride. If the recorder is used frequently, the recording heads and pads should be cleaned once a week. The heads should be cleaned with a clean, soft cloth; and the pads should be cleaned with a brush.

Demagnetization

Magnetized heads cause hissing noises and distortion. The head on the recorder should be demagnetized occasionally to avoid these troubles. To demagnetize the heads, remove the head assembly and place it in contact with a bulk tape eraser or a head demagnetizer. First switch on the demagnetizer, then bring the head close to the demagnetizer on all sides of the head assembly. Finally move the head assembly slowly away from the demagnetizer about two feet before switching off the demagnetizer.

Symptom	Cause	Remedy
Not enough torque in motors.	1. All motors have egg-shaped bronze oilite bearings. While the recorder is being handled, it may be jarred sufficiently to pull these bearings slightly out of adjustment.	1. Allow the motor to run without a reel on the unit. Lightly tap each end of the motor shaft crosswise with a screwdriver handle, or lightly tap the motor with a tack hammer.
Tape breaks.	1. Tape wound too loosely on reel.	1. Rewind tape.
	2. Control Switch knob operated improperly.	2. Use a deliberate snapping motion rather than a squeezing motion when operating Control Switch knob.
	3. Different size reels are used together.	3. Only the same size reels should be used on both reel flanges.
Wow and flutter.	1. Drive belt (63) slips.	1. Drive belt (63) should be replaced if it has stretched or has become saturated with oil. The belt also will slip if there is a film of oil on flywheel (62). Wipe any oil from affected parts with a clean cloth and carbon tetrachloride.
	2. Defective pressure roller (28), caused by recorder sitting for a long time in the Play-Record position with the unit not running.	2. To remove depression in pressure roller (28), play the recorder for a few hours.
	3. Insufficient pull between pressure roller (28) and capstan.	3. Clean pressure roller (28) and the capstan; increase the tension by adjusting socket head capscrew (47), as described under "Timing."
	4. Capstan eccentric.	4. Replace flywheel, shaft, and capstan assembly (62).
Tape drive does not operate when unit is in Play-Record.	1. Drive belt (63) loose or broken.	1. Replace drive belt (63) if broken; reposition drive belt (63) if loose.
	2. Defective drive motor (75).	2. Replace drive motor (75).
Poor response.	1. Dirty heads.	1. Clean heads with a soft cloth and carbon tetrachloride.
	2. Improper head alignment.	2. Align heads as described under "Heads."
	3. Improper pressure pad tension.	3. Pressure pads (24B) should sit horizontally on the heads with only a slight tension, as described under "Heads."

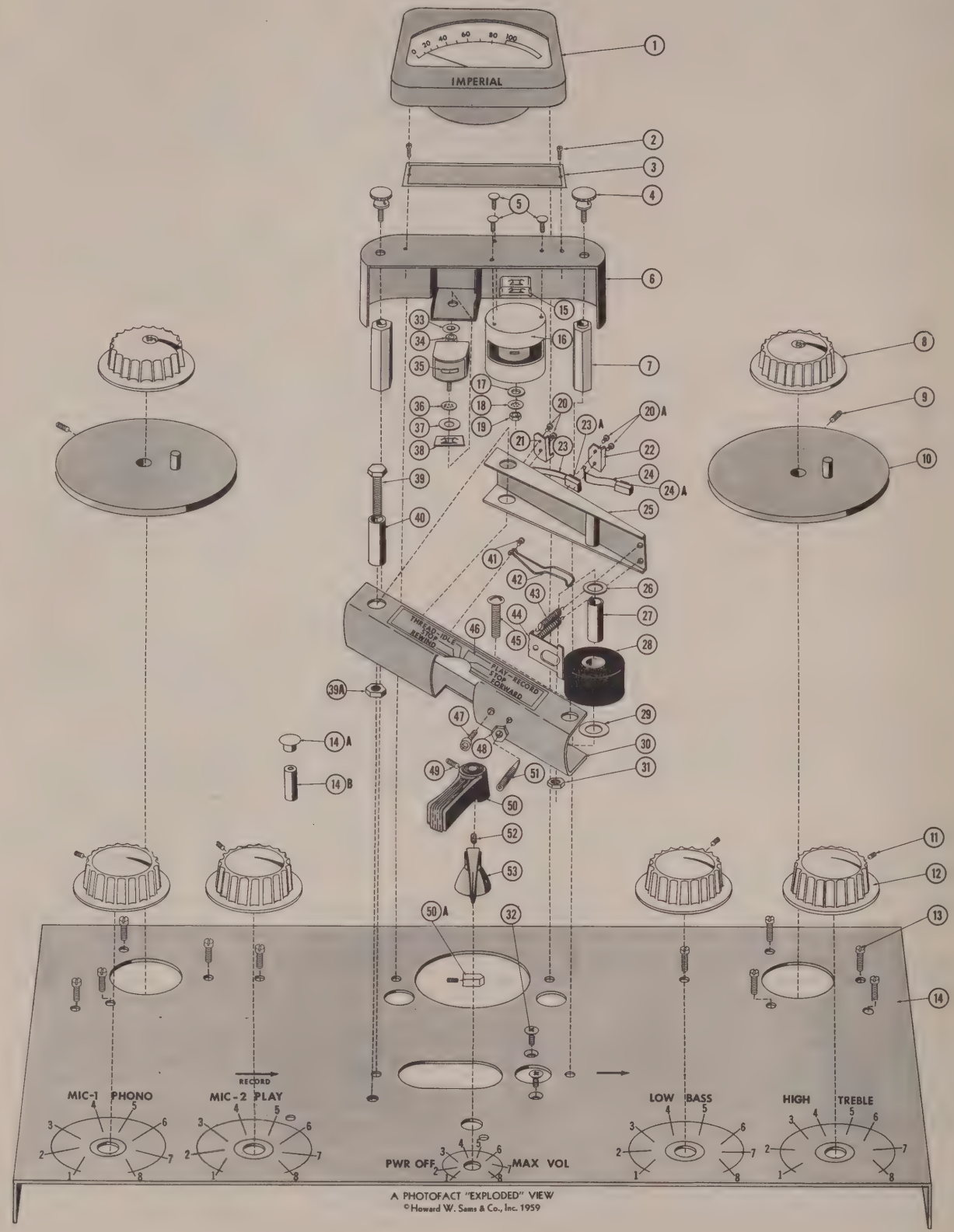


FIG. 2A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

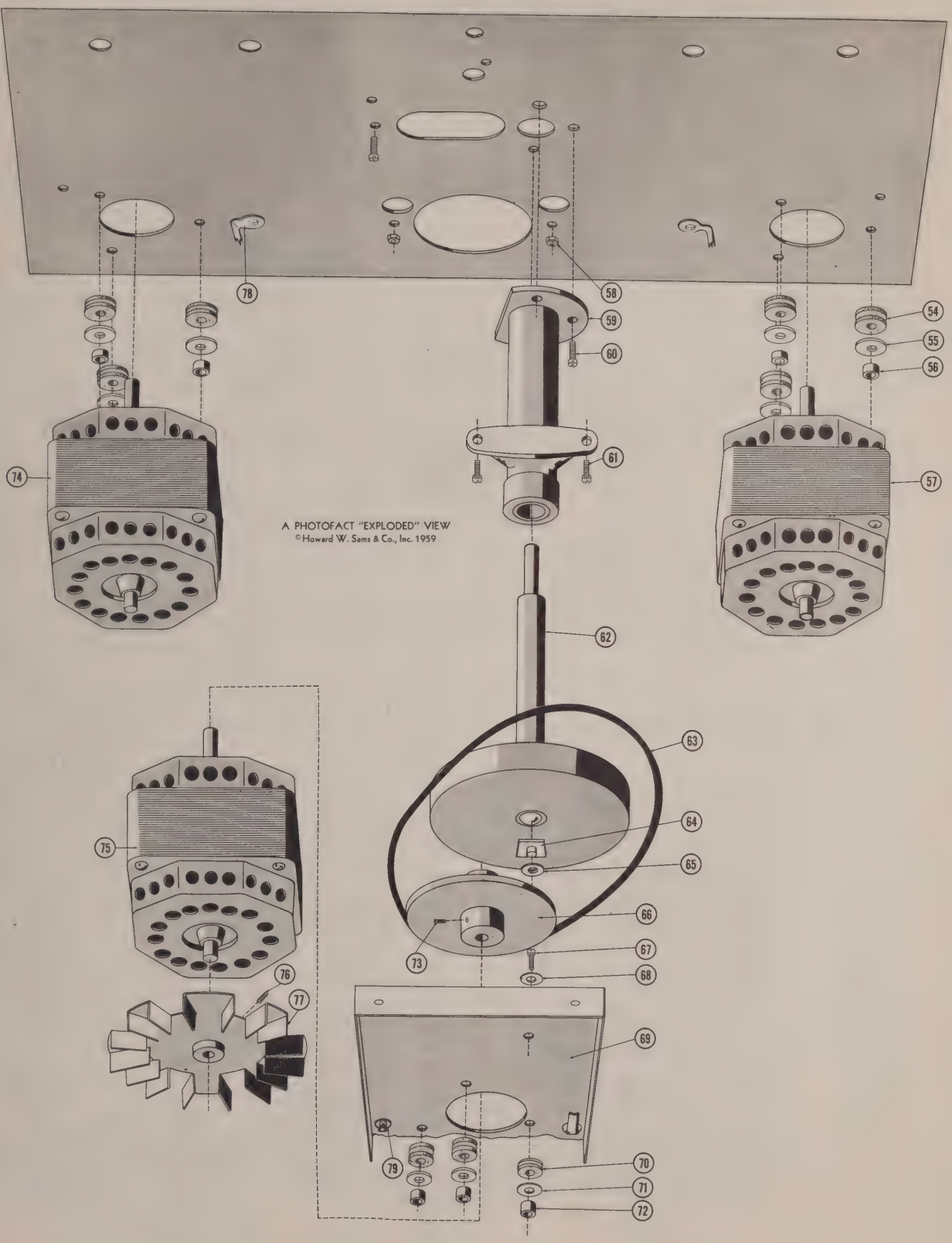


FIG. 2B EXPLODED VIEW OF PARTS BELOW BASEPLATE

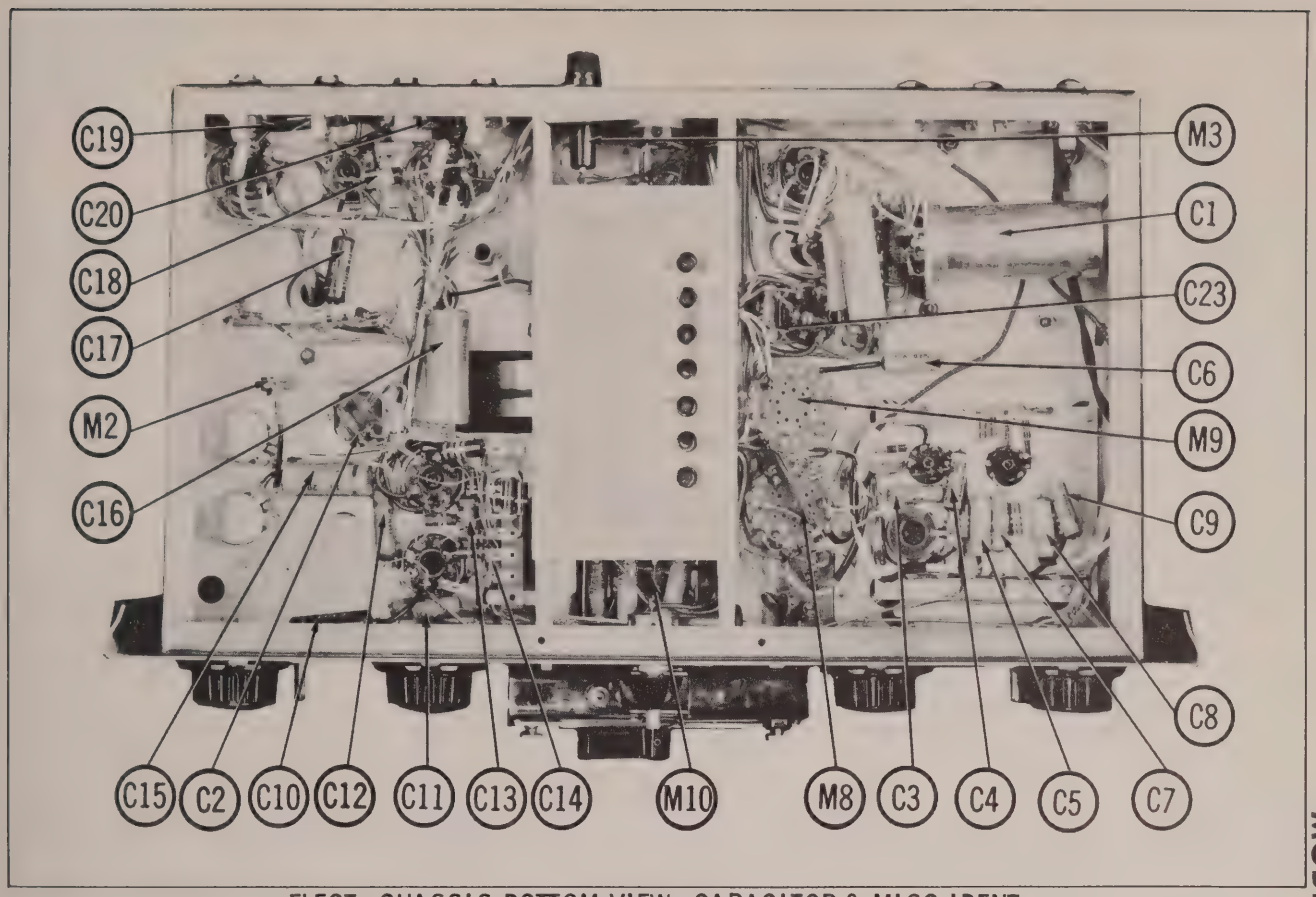
TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	4. Worn heads.	4. When the heads have had considerable use and show wear, they should be replaced.
Electromagnetic braking fails to stop tape.	1. Selenium M1 or a component defective.	1. Check circuit for defective component(s).

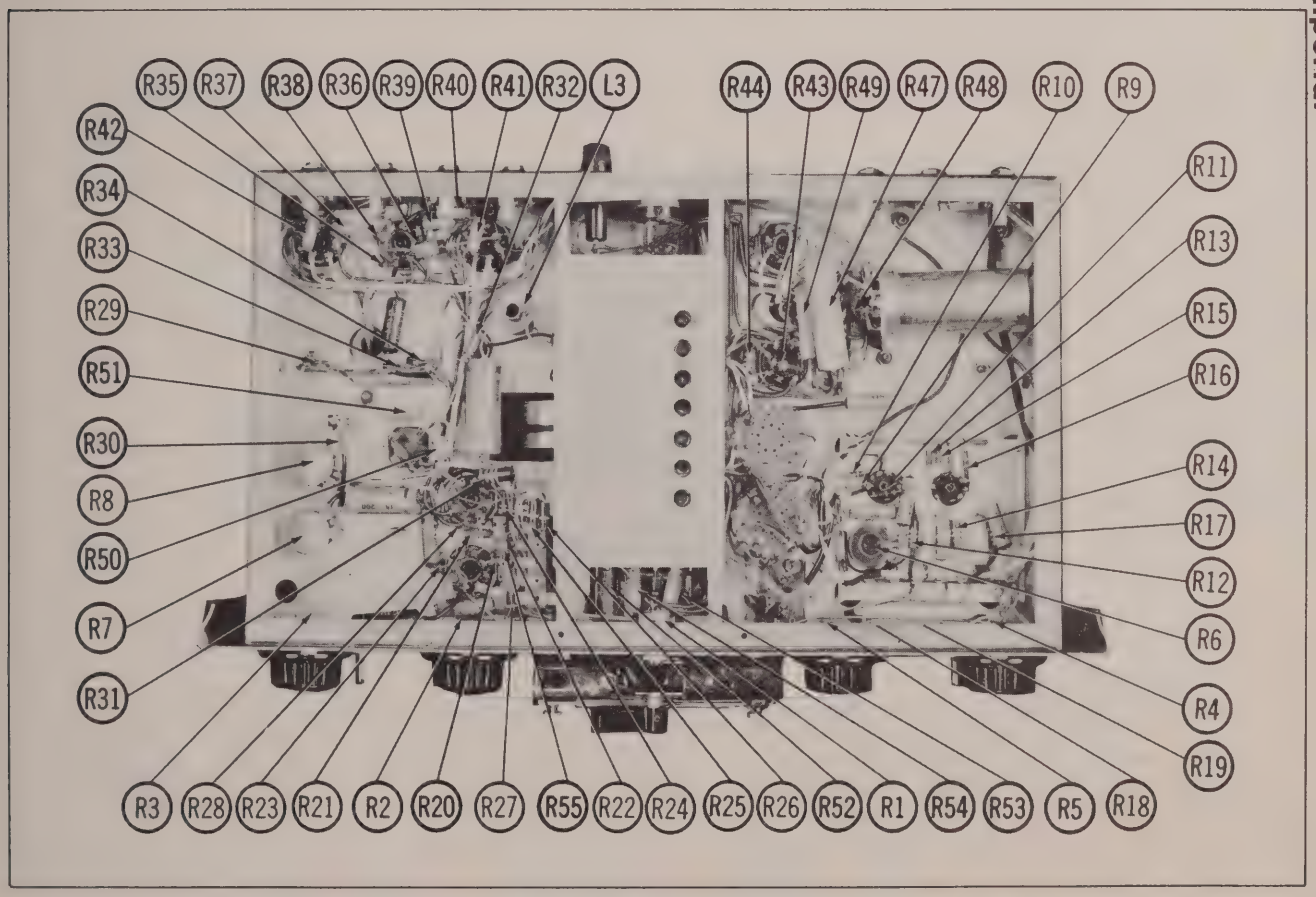
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	CI-1	VU Meter
2	CI-2	Name Plate Mounting Screws (2) 2-56 x 1/4"
3	CI-3	Upper Name Plate
4	CI-4	Thumbscrew (2) 8-32 x 1/2"
5	CI-5	Play-Record Head Mtg. Screws (3) 3-48 x 3/8"
6	CI-6	Head Cover
7	CI-7	Head Mounting Posts (2)
8	CI-8	Reel Hold-Down Knobs (2)
9	CI-9	Set Screws (2) 10-32 x 3/16"
10	CI-10	Reel Flange (2)
11	CI-11	Set Screw 6-32 x 5/8"
12	CI-12	Control Knobs (4)
13	CI-13	Front Panel Mounting Screws 8-32 x 3/8" and 8-32 x 5/8"
14	CI-14	Front Panel
14A	CI-14A	Record-Play Button
14B	CI-14B	Sleeve
15	CI-15	Speed Nuts (2)
16	CI-16	Play-Record Head
17	CI-17	Fiber Washer (Black)
18	CI-18	Lockwasher
19	CI-19	Hex Nut
20	CI-20	Left Tape Guide Screws (2) 3-48 x 1/8" RHMS
20A	CI-20A	Right Tape Guide Screws (2) 3-48 x 3/16" FHMS
21	CI-21	Left Tape Guide
22	CI-22	Right Tape Guide
23	CI-23	Erase Pad Spring
23A	CI-23A	Erase Pressure Pad
24	CI-24	Play-Record Pad Spring
24A	CI-24A	Play-Record Pressure Pad
25	CI-25	Inner Bar
26	CI-26	Pressure Roller Washer
27	CI-27	Pressure Roller Shaft
28	CI-28	Pressure Roller
29		Same as CI-26
30	CI-30	Outer Pressure Bar
31	CI-31	Hex Nut 8-32
32	CI-32	Housing Subassembly Mtg. Screws (2) 8-32 x 1/2" FHMS
33	CI-33	Washer (Black)
34	CI-34	Erase Head Mtg. Nut
35	CI-35	Erase Head
36	CI-36	Lockwasher
37	CI-37	Washer
38	CI-38	Speed Nut

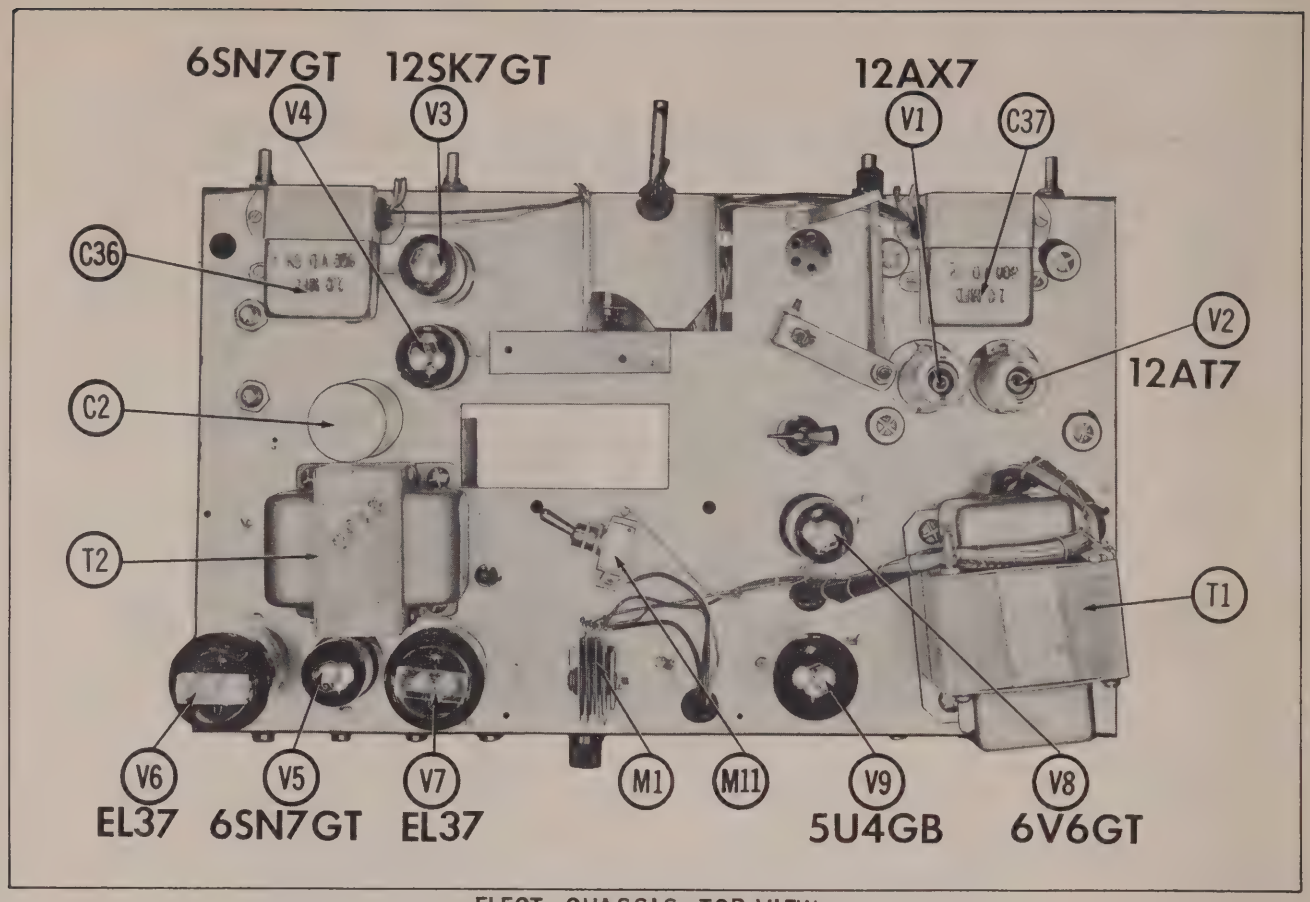
Ref. No.	Part No.	Description
39	CI-39	Pivot Bolt
40	CI-40	Sleeve
41	CI-41	Return Spring Mtg. Screw 6-32 x 1/8" RHMS
42	CI-42	Return Spring
43	CI-43	Tension Springs (2)
44	CI-44	Tension Adjuster
45	CI-45	Screw 8-32 x 1" Trimmit
46	CI-46	Lower Name Plate
47	CI-47	6-32 x 1/2" Socket Head Capscrew
48	CI-48	Lock Nut 10-32
49	CI-49	Set Screw 8-32 x 1/4"
50	CI-50	Control Switch Knob
50A	CI-50A	Cam
51	CI-51	Inner Bar Action Adj. Stud 10-32 x 1 1/4"
52	CI-52	Set Screw 8-32 x 1/2"
53	CI-53	Small Pointer Knob (Volume)
54	CI-54	Hard Motor Mount Grommets (6)
55	CI-55	Motor Mount Washer (6)
56	CI-56	This spacer is an integral part of the motor and cannot be removed.
57	CI-57	Take-up Motor
58	CI-58	VU Meter Mtg. Nuts (2) 6-32 Hex Nut
59	CI-59	Bearings, Housing Assembly
60	CI-60	Head Post Mounting Screw 10-32 x 1/2"
61	CI-61	Screws (2) 8-32 x 3/8" Trimmit
62	CI-62	Flywheel Shaft, Capstan Subassy.
63	CI-63	Drive Belt
64	CI-64	Nylon Bumper
65	CI-65	Washer
66	CI-66	Drive Pulley
67	CI-67	Motor Mtg. Screws (3)
68	CI-68	Washer (3)
69	CI-69	Drive Motor Mounting Plate
70	CI-70	Soft Motor Mount Grommet (6)
71	CI-71	Motor Mount Washer (3)
72	CI-72	This spacer is an integral part of the motor.
73	CI-73	Set Screw 10-32 x 3/8"
74	CI-74	Rewind Motor
75	CI-75	Drive Motor
76	CI-76	Fan Set Screw 8-32 x 1/4"
77	CI-77	Fan
78	CI-78	Front Panel Brace
79	CI-79	Motor Panel Brace (2)



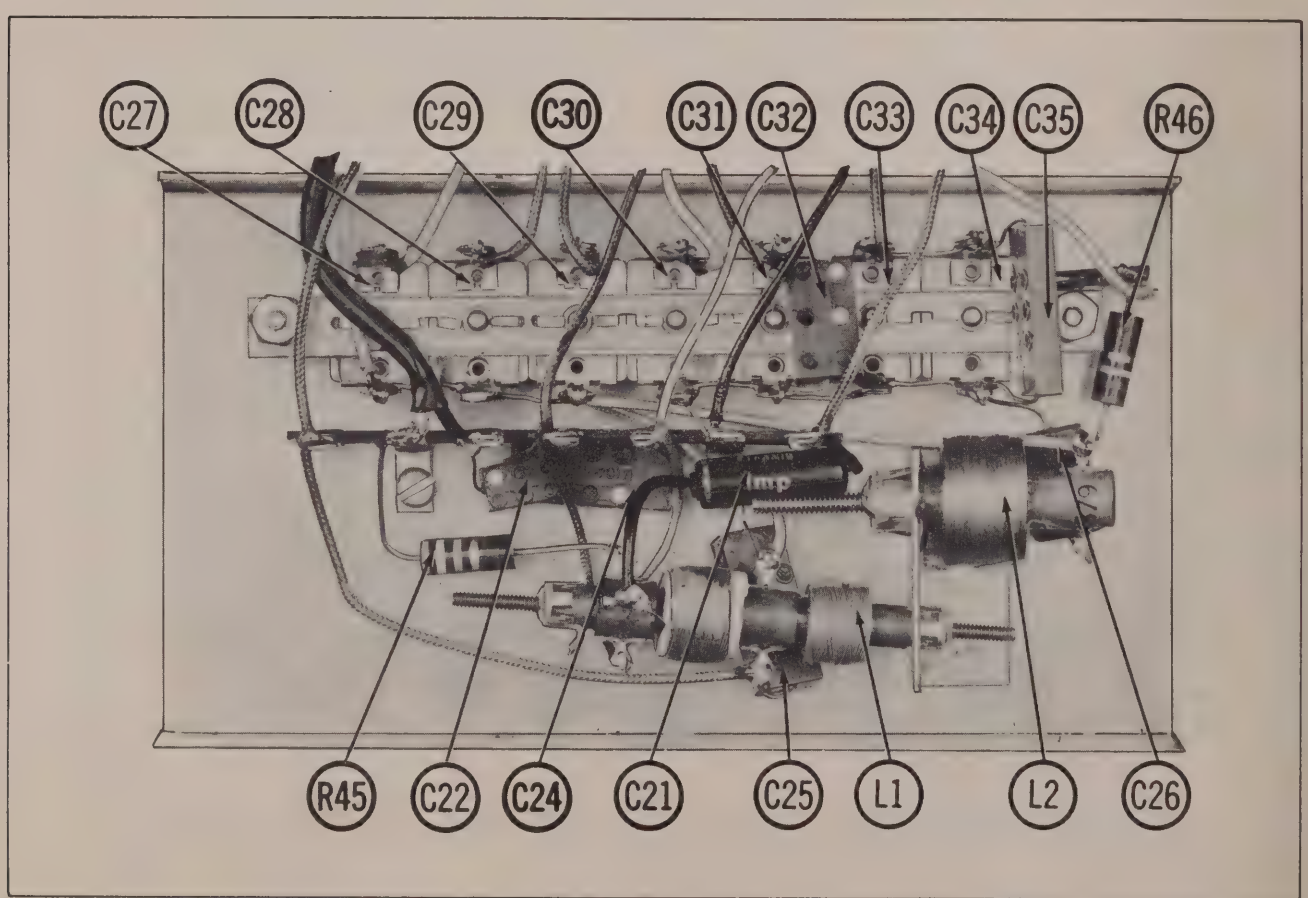
ELECT. CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.



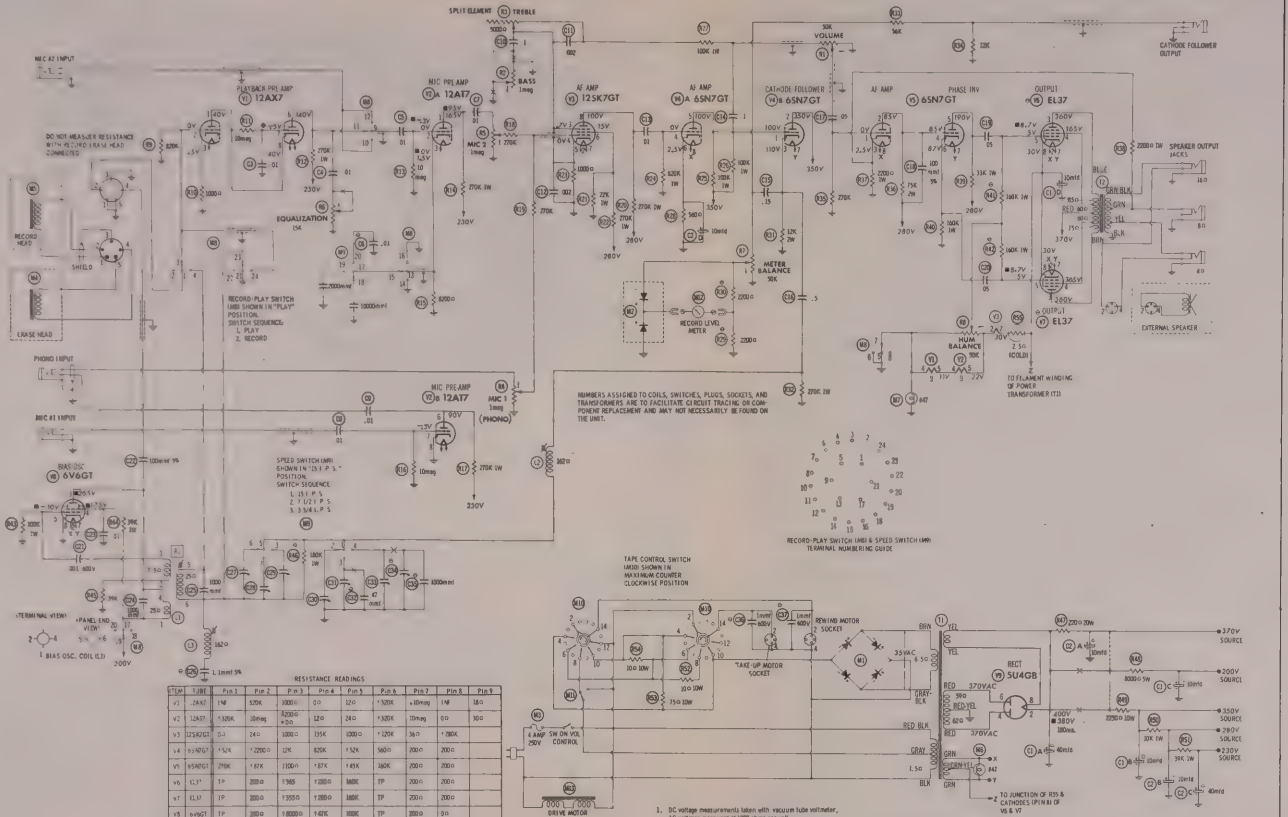
ELECT. CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



ELECT. CHASSIS-TOP VIEW



SUB-CHASSIS


MIC #2 INPUT
PLAYBACK PRE AMP V1 12AX7
SPLIT ELEMENT
TREBLE
BASS
MIC PREAMP V2a 12AT7
MIC 2
AF AMP V3 12SK7GT
AF AMP V4a 6SN7GT
CATHODE-FOLLOWER V4b 6SN7GT
VOLUME
CATHODE FOLLOWER OUTPUT
AF AMP V5 6SN7GT
PHASE INV
OUTPUT V6 EL37
SPEAKER OUTPUT JACKS
DO NOT MEASURE RESISTANCE WITH RECORD (RAM) HEAD CONNECTED
RECORD HEAD
SHIELD
ERASE HEAD
EQUALIZATION
RECORD-PLAY SWITCH (MR) SHOWN IN "PLAY" POSITION. SWITCH SEQUENCE: 1. PLAY 2. RECORD
METER BALANCE
RECORD LEVEL METER
HUM BALANCE
TO FILAMENT WINDING OF POWER TRANSFORMER (T3)
OUTPUT V7 EL37
EXTERNAL SPEAKER
PHONO INPUT
MIC #1 INPUT
MIC PREAMP V2b 12AT7
MIC 1 (PHONO)
RECT V8 6V6GT
SPEED SWITCH (MR) SHOWN IN "33 R.P.M." POSITION. SWITCH SEQUENCE: 1. 33 R.P.M. 2. 71/2 R.P.M. 3. 3 3/4 R.P.M.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
RECORD-PLAY SWITCH (MR) & SPEED SWITCH (MR) TERMINAL NUMBERING GUIDE
TERMINAL VIEW
PANEL END VIEW
BIAS OSC. COIL (L3)
TAPE CONTROL SWITCH (MR) SHOWN IN MAXIMUM COUNTER CLOCKWISE POSITION
REWIND MOTOR
"TAKE-UP" MOTOR SOCKET
4 AMP SW ON VOL 250V CONTROL
DRIVE MOTOR
RECT V9 5U4GB
370V SOURCE
200V SOURCE
350V SOURCE
280V SOURCE
230V SOURCE
TO JUNCTION OF R35 & CATHODES (PIN 8) OF V6 & V7

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
v1	12AX7	1M	570K	1000Ω	0Ω	12Ω	+320K	+.6meg	1M	1MΩ
v2	12AT7	+320K	.26meg	8200Ω +0Ω	12Ω	24Ω	+320K	1.0meg	0Ω	30Ω
v3	12SK7GT	0Ω	24Ω	1000Ω	135K	1000Ω	+125K	36Ω	+280K	
v4	6SN7GT	+52K	+220Ω	12K	820K	+52K	560Ω	200Ω	200Ω	
v5	6SN7GT	270K	+87K	1100Ω	+87K	+45K	360K	200Ω	200Ω	
v6	EL37	TP	200Ω	9.5KΩ	+200Ω	160K	TP	200Ω	200Ω	
v7	EL37	TP	200Ω	+350Ω	+200Ω	160K	TP	200Ω	200Ω	
v8	6V6GT	TP	200Ω	+8000Ω	+427K	300K	TP	200Ω	0Ω	
v9	5U4GB	NC	5	NC	620Ω	NC	590Ω	NC	5	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
‖ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED IN "RECORD" POSITION.
† MEASURED FROM PIN 2 OF V5.
• MEASURED FROM PIN 8 OF V5.

NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CROWN
MODEL Imperial

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Playback Preamplifier	12AX7	
V2	Mike Preamplifier	12AT7	
V3	AF Amplifier	12SK7GT	
V4	AF Amplifier - Cathode Follower	6SN7GT	
V5	AF Amp. - Phase Inverter	6SN7GT	
V6	Output	EL37	①
V7	Output	EL37	①
V8	Bias Oscillator	6V6GT	
V9	Rectifier	5U4GB	

① Some versions may use 6L6G.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CROWN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	475		AFH4-19-40	D0179.7	FP475.5	TMT-47	TVL-4838	
B	■10	475					TD-10-500		
C	▲10	475							
D	10	475							
C2A	▲10	475		AFH4-19-40	D0179.7	FP475.5	TMT-47	TVL-4838	
B	■10	475					TD-10-500		
C	▲40	475							
D	10	475							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	CROWN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C4	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C5	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C6	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	①
C7	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C8	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C9	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C10	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C11	.002	400			P488N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C12	.002	400			P488N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C13	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C14	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	.15	200			P288N-15		CUB2P15	GEM-2015	2TM-P15	
C16	.5	200			P288N-5		CUB2P5	GEM-205	2TM-P5	
C17	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	CROWN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C18	100		5%		1469-0001		22R5T1	MCE235	MS-31	
C19	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C20	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C21	.001	600			P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C22	100		5%		1469-0001		22R5T1	MCE235	MS-31	
C23	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C24	1000				1467-001		1W5D1	MC255	1FM-21	
C25	1000				1467-001		1W5D1	MC255	1FM-21	
C26	11		5%		1469-000011		22R5Q12		MS-412	②
C27										
C28										
C29										
C30										
C31										
C32	47				1468-000047		5W5Q47		1FM-447	③
C33										
C34										③
C35	1000				1467-001		1W5D1	MC255	1FM-21	③
C36	1.0	600		6JP30-1.0					BP-106	④
C37	1.0	600		6JP30-1.0					BP-106	④

① Values may vary. Replace with original value.
② Some versions may use 45mmf in this application.
③ Not used in some versions.
④ Some versions may use .5mfd in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROWN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	50K	½	BH4515	B-34	A47-50K-Z	Q13-123	U33	Volume
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Off-On
R2A	1meg	½	BH4514	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3	5000Ω	½	DQ4274					Treble (Split element)
R4A	1meg	½	BH4514	B-69	A47-1meg-S	Q11-137	U54	Mic. 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	1meg	½	BH4514	B-69	A47-1meg-S	Q11-137	U54	Mic. 2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6	15K	½	BW5313					Equalization
R7A	50K	½	BH4518	B-31	A47-50K-S	Q11-123	U35	Meter Balance
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R8A	50K	½	BH4518	B-31	A47-50K-S	Q11-123	U35	Hum Balance
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	CROWN PART No.	NOTES
R9	820K			
R10	1000Ω			
R11	10meg			
R12	270K	1		
R13	10meg			
R14	270K	1		
R15	8200Ω			
R16	10meg			
R17	270K	1		
R18	270K			
R19	270K			
R20	270K	1		
R21	22K	1		
R22	270K	1		
R23	1000Ω			
R24	820K	1		
R25	100K	1		
R26	100K	1		
R27	100K	1		
R28	560Ω			
R29	2200Ω			Note 1
R30	2200Ω			Note 1
R31	12K	2		
R32	270K			
R33	56K			
R34	12K			
R35	270K			
R36	75K	2		
R37	2200Ω	1		
R38	2200Ω	1		
R39	33K	1		
R40	33K	1		
R41	160K	1		Note 2
R42	160K	1		Note 2
R43	100K	1		
R44	39K	1		
R45	39K	1		
R46	180K	1		Note 3
R47	220Ω	20		
R48	8000Ω	5		
R49	2250Ω	10		
R50	10K	1		
R51	39K	1		
R52	10Ω	10		
R53	75Ω	10		
R54	10Ω	10		
R55	2.5Ω(Cold)			

Note 1. Some versions may use 1000Ω in this application.
Note 2. Some versions may use 180K in this application.
Note 3. Some versions may use 160K in this application.

COILS

ITEM No.	USE	REPLACEMENT DATA CROWN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.							
L2	Tone Choke					6330		100MH
L3	Tone Choke					6330		100MH

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA CROWN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.4A Tap ② 85V ② 1A	740VCT ② .18A	35V ② 2A	200P3						
	SEC. 3	SEC. 4	SEC. 5							
	5V ② 3A	6.3VCT ② 4.4A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CROWN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6000Ω CT Screen Taps ② 1500Ω CT	16Ω Taps ② 8Ω, 4Ω	200A1							

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA CROWN PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1 M2	2.0A	②	1017 ①		60-7204 ①	604B ①	① Selenium Type ② Copper Oxide Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA CROWN PART No. FUSE	CROWN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG	4A 250V			312004. (3AG 4A 250V)	342001	MTH4	HCM

MISCELLANEOUS

ITEM No.	PART NAME	CROWN PART No.	NOTES
M4	Erase Head		
M5	Record Head		
M6	Lamp		#47
M7	Lamp		#47
M8	Switch		Record-Play (Rotary Wafer Type)
M9	Switch		Speed Equalizer (Rotary Wafer Type)
M10	Switch		Tape Control (Rotary Wafer Type)
M11	Switch		Motor Switch, SPDT (Toggle Type)
M12	Meter		Record Level
M13	Motor		Drive
M14	Motor		Rewind
M15	Motor		Take up

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

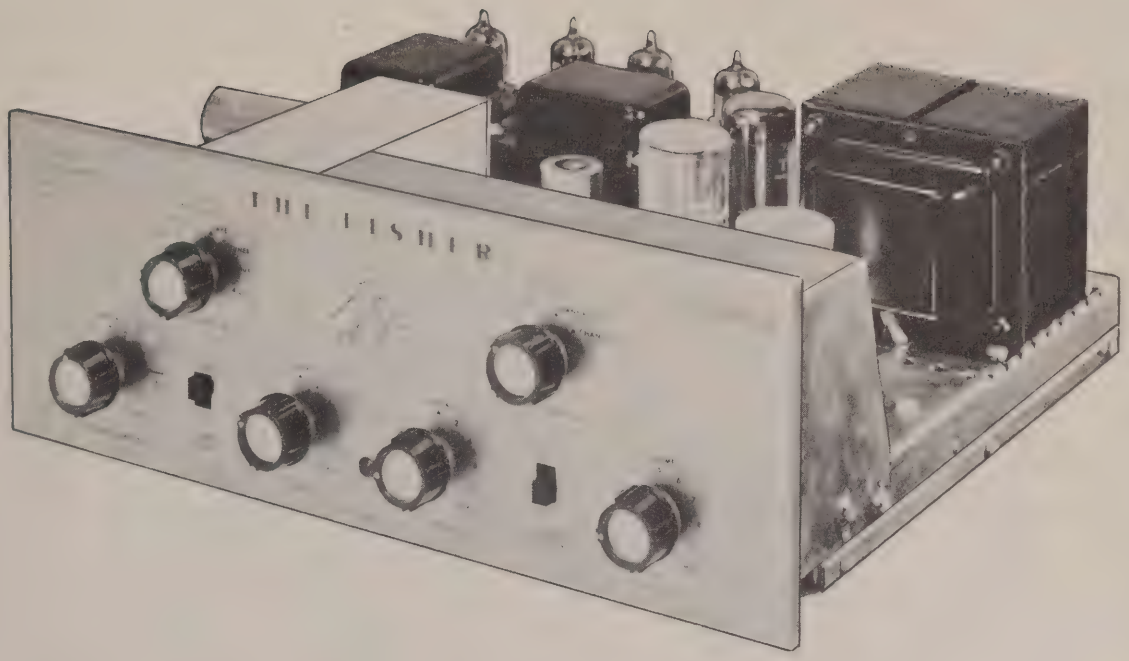
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA

FISHER
MODEL X-101

FISHER
MODEL X-101



FISHER
MODEL X-101

TRADE NAME	Fisher Model X-101		
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.		
TYPE SET	AC Operated 11 Tube Stereo Amplifier		
POWER SUPPLY	105-125 Volts AC, 50-60 Cycles	RATING	150 Watts, 1.4 Amp. @ 117 Volts AC

ADJUSTMENTS

PHASE INVERTER BALANCE ADJUSTMENT (R5 and R6)

1. Connect an accurately calibrated, low distortion audio generator to the Channel A Tuner input receptacle.
2. Connect a 16Ω 100W resistor across the Channel A 16Ω and ground speaker terminals.
3. Connect either a harmonic or intermodulation distortion analyzer across the resistor.
4. Set the generator to 1000∿ with an output slightly below the clipping point of the amplifier output. Keep generator output constant.
5. Adjust Phase Inverter Balance (R5) for minimum distortion.
6. Repeat above procedure for Channel B.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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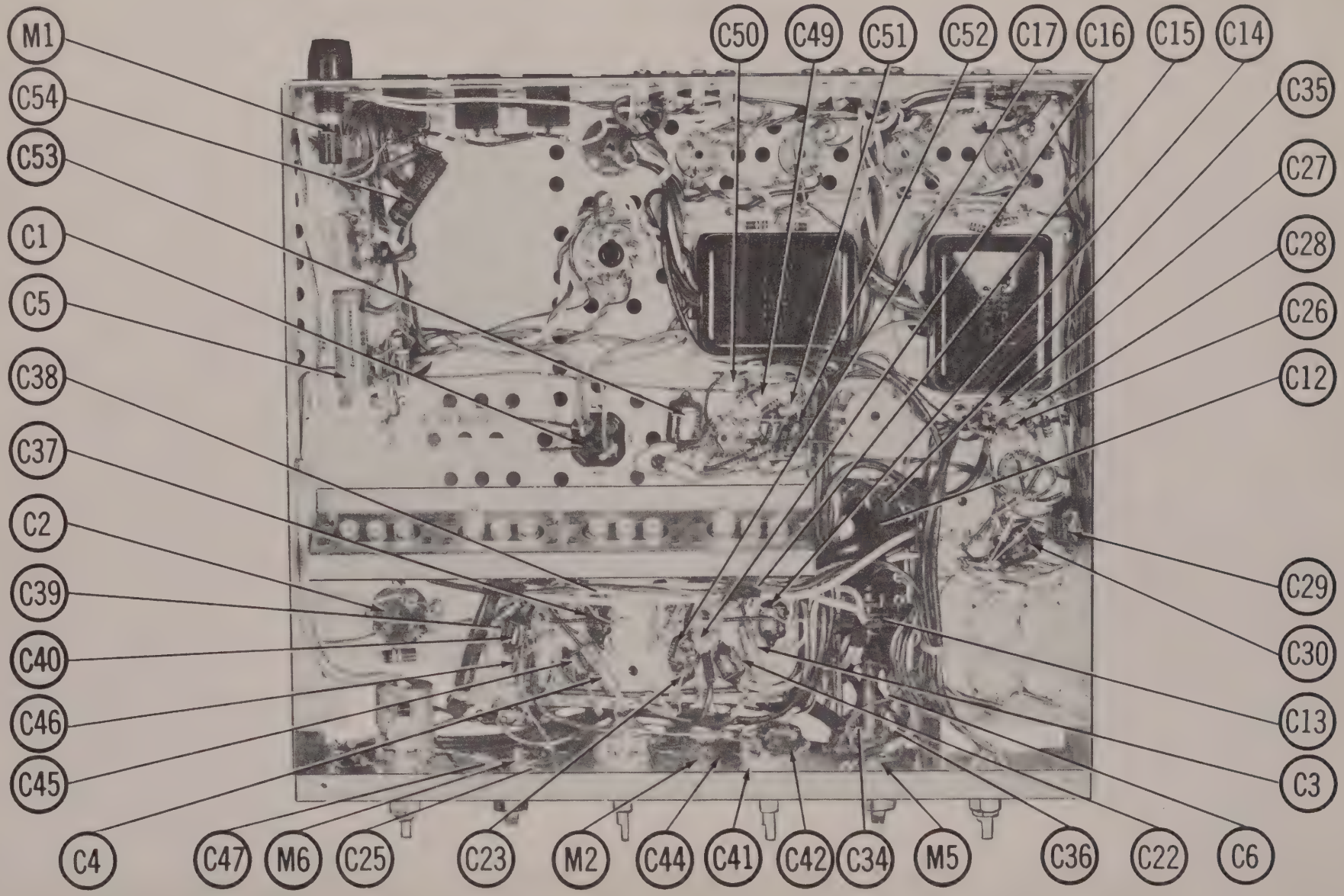
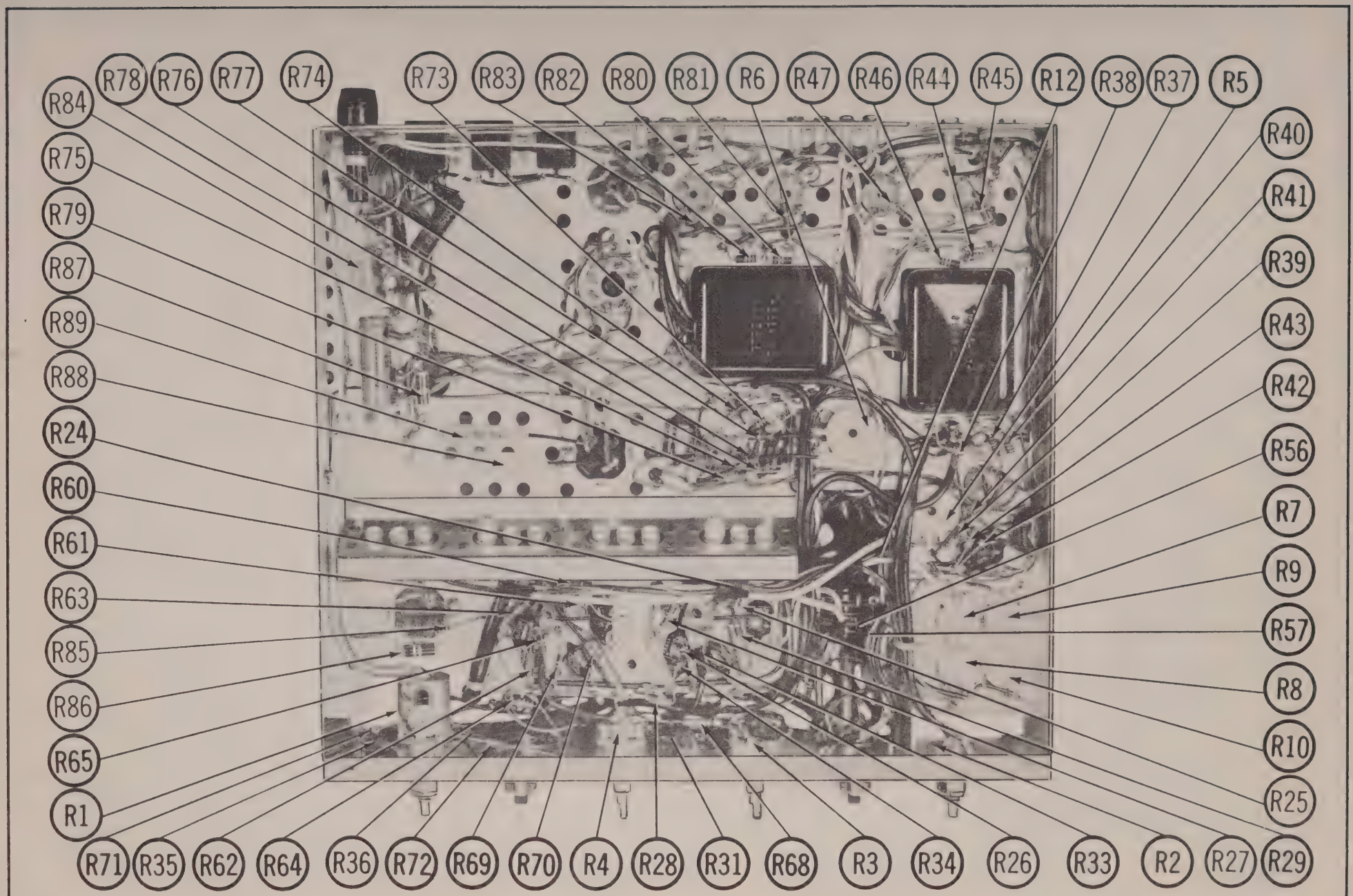
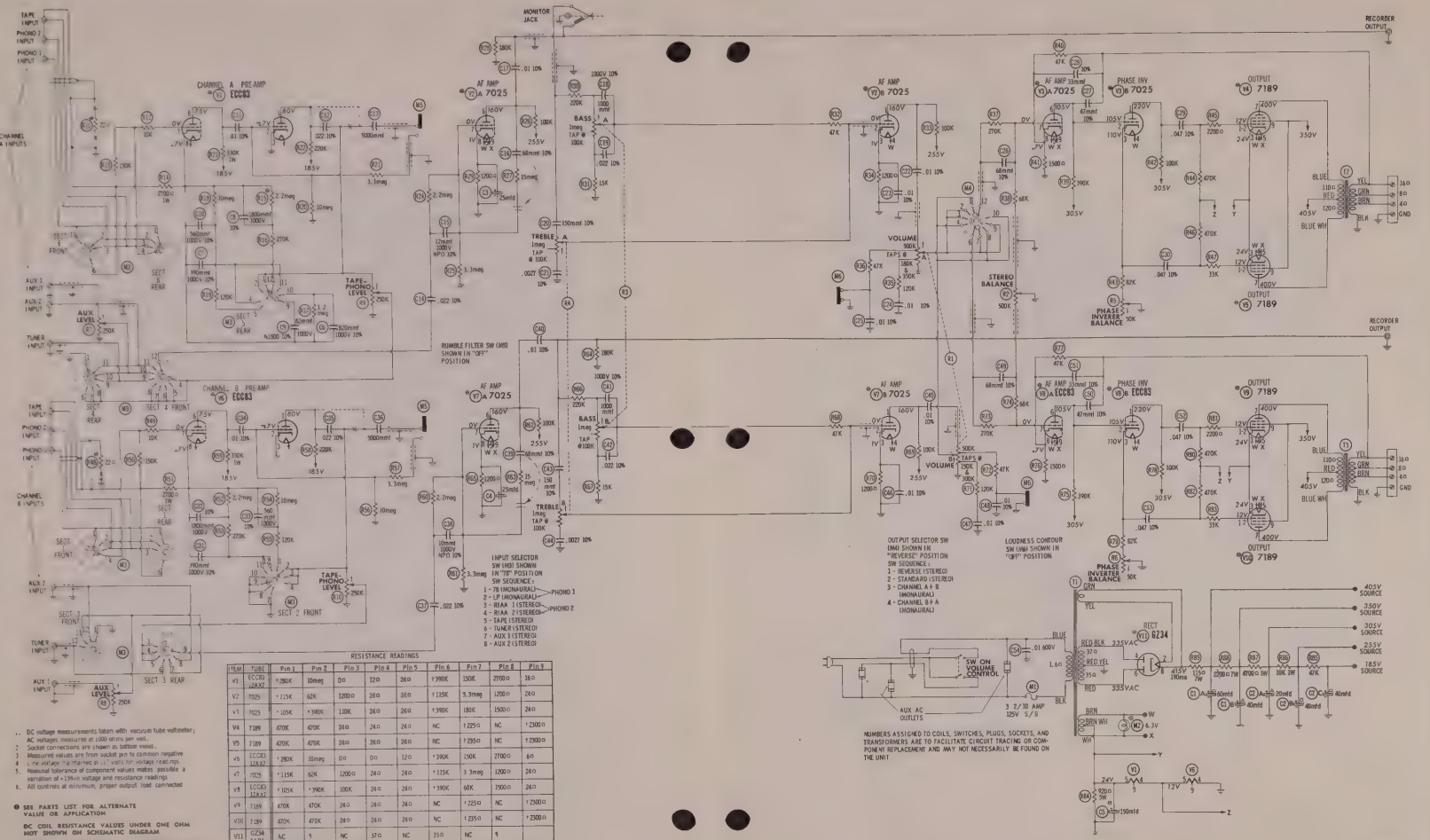


CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT



CHASSIS BOTTOM VIEW - RESISTOR IDENT


MONITOR JACK
RECORDER OUTPUT
CHANNEL A PRE-AMP V1 ECC83
CHANNEL B PRE-AMP V6 ECC83
AF AMP V2 A 7025
AF AMP V7 A 7025
AF AMP V4 B 7025
AF AMP V9 B 7025
PHASE INV V3 A 7025
PHASE INV V8 A ECC83
OUTPUT V5 7189
OUTPUT V10 7189
BASS
TREBLE
VOLUME
STEREO BALANCE
PHASE INVERTER BALANCE
RUMBLE FILTER SW (MR) SHOWN IN "OFF" POSITION
INPUT SELECTOR SW (MA) SHOWN IN "TP" POSITION
SW SEQUENCE:
1 - 78 (MONAURAL) — PHONO 1
2 - LP (MONAURAL)
3 - RIAA 1 (STEREO)
4 - RIAA 2 (STEREO) — PHONO 2
5 - TAPE (STEREO)
6 - TUNER (STEREO)
7 - AUX 1 (STEREO)
8 - AUX 2 (STEREO)
OUTPUT SELECTOR SW (MA) SHOWN IN "REVERSE" POSITION
SW SEQUENCE:
1 - REVERSE (STEREO)
2 - STANDARD (STEREO)
3 - CHANNEL A + B (MONAURAL)
4 - CHANNEL B + A (MONAURAL)
LOUDNESS CONTOUR SW (MB) SHOWN IN "OFF" POSITION
TAPE INPUT
PHONO 2 INPUT
PHONO 1 INPUT
CHANNEL A INPUTS
AUX 1 INPUT
AUX 2 INPUT
TUNER INPUT
AUX LEVEL
TAPE PHONO LEVEL
SECT 1 FRONT
SECT 2 FRONT
SECT 3 REAR
SECT 4 FRONT
SECT 5 REAR
CHANNEL B INPUTS
SW ON VOLUME CONTROL
AUX AC OUTLETS
3 2/10 AMP 125V S/B
RECT V11 B234
405V SOURCE
350V SOURCE
305V SOURCE
255V SOURCE
185V SOURCE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†280K	10meg	0Ω	12Ω	24Ω	†390K	150K	2700Ω	16Ω
V2	7025	†115K	62K	1200Ω	24Ω	24Ω	†115K	3.3meg	1200Ω	24Ω
V3	7025	†105K	†390K	110K	24Ω	24Ω	†390K	180K	1500Ω	24Ω
V4	7189	470K	470K	24Ω	24Ω	24Ω	NC	†225Ω	NC	†2300Ω
V5	7189	470K	470K	24Ω	24Ω	24Ω	NC	†235Ω	NC	†2300Ω
V6	ECC83 12AX7	†280K	10meg	0Ω	0Ω	12Ω	†390K	150K	2700Ω	6Ω
V7	7025	†115K	62K	1200Ω	24Ω	24Ω	†115K	3.3meg	1200Ω	24Ω
V8	ECC83 12AX7	†105K	†390K	100K	24Ω	24Ω	†390K	60K	1500Ω	24Ω
V9	7189	470K	470K	24Ω	24Ω	24Ω	NC	†225Ω	NC	†2300Ω
V10	7189	470K	470K	24Ω	24Ω	24Ω	NC	†235Ω	NC	†2300Ω
V11	GZ34 5AR4	NC	¶	NC	37Ω	NC	35Ω	NC	¶	

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative (chassis voltage is attached at all points for voltage readings).
4. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
5. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ΩC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

† MEASURED FROM PIN 8 OF V11.

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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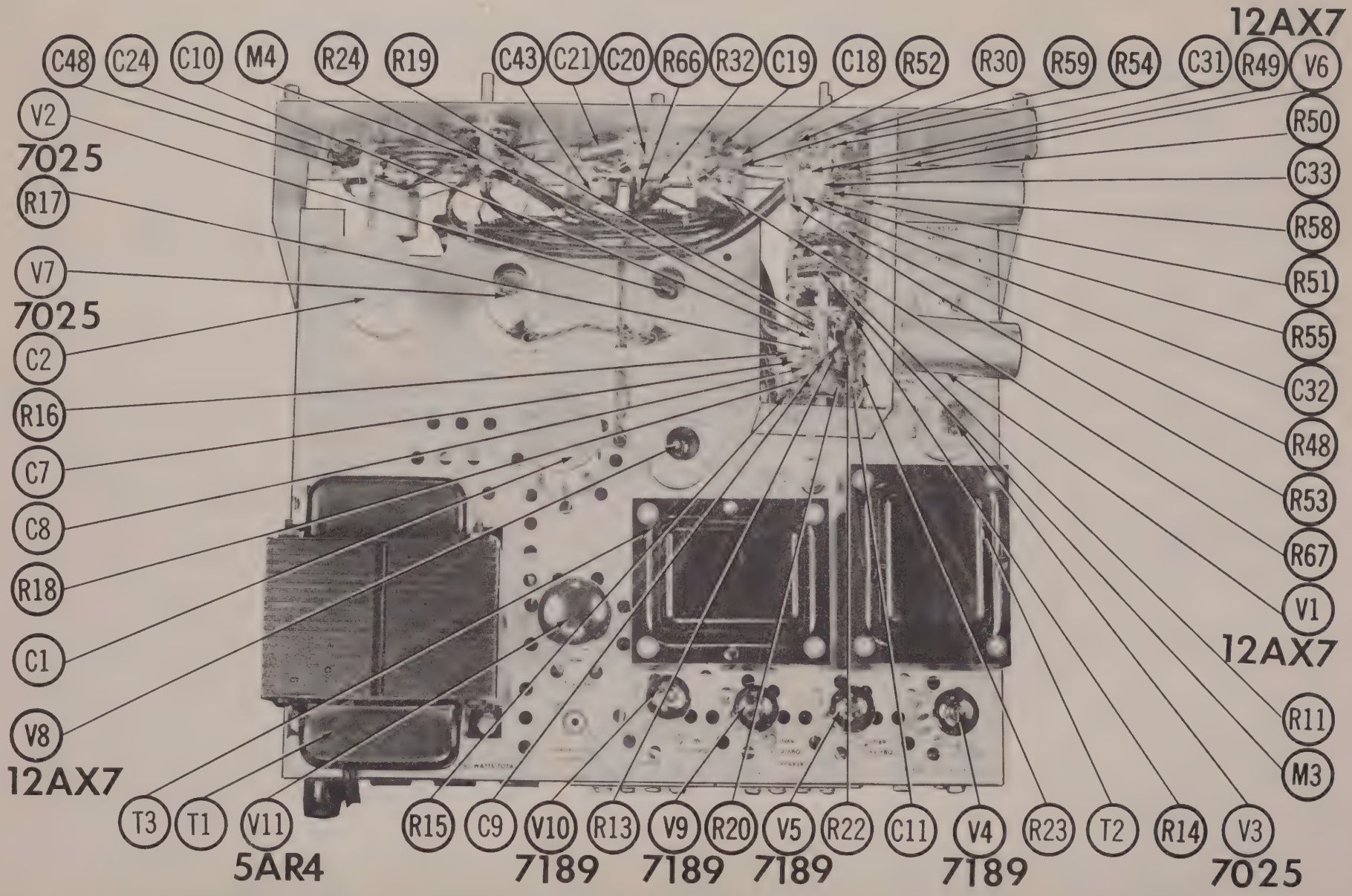
FISHER
MODEL X-101



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Channel A Preamplifier	ECC83/12AX7 ①
V2	Channel A AF Amplifier	7025 ②
V3	Channel A AF Amplifier-Phase Inverter	7025 ②
V4	Channel A Output	7189 ③
V5	Channel A Output	7189 ③

ITEM No.	USE	TYPE
V6	Channel B Preamplifier	ECC83/12AX7 ①
V7	Channel B AF Amplifier	7025 ②
V8	Channel B AF Amplifier-Phase Inverter	ECC83/12AX7 ①
V9	Channel B Output	7189 ③
V10	Channel B Output	7189 ③
V11	Rectifier	GZ34/5AR4

① Alternate Type 7025. ② Alternate Type ECC83/12AX7. ③ Alternate Type EL84/6BQ5.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	450	C663-136	AFH2-58	A0500	FP239	TMD-56	TVL-2766	
B	▲40	450			BR4045				
C2A	▲20	450	C563-127	AFH3-43-50	B0450	FP376.9	TMT-39	TVL-3786	
B	■40	450			BR2045				
C	▲40	450							
C3	25	6	C639-114	SRE6V25	BBR25-6	TT6X25	TD-25-25	TVA-1205	
C4	25	6	C639-114	SRE6V25	BBR25-6	TT6X25	TD-25-25	TVA-1205	
C5	150	30	①	PRS50V150	BR1505	TC25015	TD-150-50	TVA-1311	

① Some versions may use 100mfd @ 100V in this application (Part #C663-143).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	820	1000	10%	C50072-7				JL-382	10HKB-T82S 10%*	
C7	390	1000	10%	C50072-6		MD-391	L10T39		10GAB-T39S 10%*	
C8	1800	1000	10%	C50072-8				JL-218	10HKB-D18S 10%*	
C9	82	1000	N1500 10%	C50070-7						
C10	560	1000	10%	C50072-14		MD-561		JL-356	10GAB-T56S 10%*	
C11	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C12	.022	250	10%	C50074-26					4TM-S22S 10%*	
C13	5000			C50089-1	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C14	.022	250	10%	C50074-26					4TM-S22S 10%*	
C15	12	1000	NPO 10%	C50070-2			C10Q12C	CNO-412		
C16	68		10%	CC21GP680K5	NPO-SI 68	D6-680	CTA6Q68C	CNO-468	5TCC-Q68S 10%*	
C17	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C18	1000	1000	10%	C50072-3				JL-210	10HKB-D1S 10%*	
C19	.022	250	10%	C50074-26					4TM-S22S 10%*	
C20	150		10%	CC21GP151K5	NPO-SI 150	D6-151	CTA6T15C	JL-315	5TCC-T15S 10%*	
C21	.0027	200	10%	C68P272K2					6TM-D27S 10%*	
C22	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C23	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C24	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C25	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C26	68		10%	CC21GP680K5	NPO-SI 68	D6-680	CTA6Q68C	CNO-468	5TCC-Q68S 10%*	
C27	47		10%	CC21GP47K5	NPO-SI 47	D6-470	CTA6Q47C	CNO-447	5TCC-Q47S 10%*	
C28	33		10%	CC21GP330K5	NPO-SI 33	D6-330	CTA6Q33C	CNO-433	5TCC-Q33S 10%*	
C29	.047	500	10%	C50074-37					6TM-S47S 10%*	
C30	.047	500	10%	C50074-37					6TM-S47S 10%*	
C31	390	1000	10%	C50072-6		MD-391	L10T39		10GAB-T39S 10%*	
C32	1800	1000	10%	C50072-8				JL-218	10HKB-D18S 10%*	
C33	560	1000	10%	C50072-14		MD-561		JL-356	10GAB-T56S 10%*	
C34	.01	125	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C35	.022	250	10%	C50074-26					4TM-S22S 10%*	
C36	5000			C50089-1	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C37	.022	250	10%	C50074-26					4TM-S22S 10%*	
C38	10	1000	NPO 10%	C50070-11			C10Q1C	CNO-410		
C39	68		10%	CC21GP680K5	NPO-SI 68	D6-680	CTA6Q68C	CNO-468	5TCC-Q68S 10%*	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C40	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C41	1000	1000	10%	C50072-3				JL-210	10HKB-D1S 10%*	
C42	.022	250	10%	C50074-26					4TM-S22S 10%*	
C43	150		10%	CC21GP151K5	NPO-SI 150	D6-151	CTA6T15C	JL-315	5TCC-T15S 10%*	
C44	.0027	200	10%	C68P272K2					6TM-D27S 10%*	
C45	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C46	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C47	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C48	.01	250	10%	C50074-25				GEM-1611	4TM-S1S 10%*	
C49	68		10%	CC21GP680K5	NPO-SI 68	D6-680	CTA6Q68C	CNO-468	5TCC-Q68S 10%*	
C50	47		10%	CC21GP470K5	NPO-SI 47	D6-470	CTA6Q47C	CNO-447	5TCC-Q47S 10%*	
C51	33		10%	CC21GP330K5	NPO-SI 33	D6-330	CTA6Q33C	CNO-433	5TCC-Q33S 10%*	
C52	.047	500	10%	C50074-37					6TM-S47S 10%*	
C53	.047	500	10%	C50074-37					6TM-S47S 10%*	
C54	.01	600		C2747	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	R663-138					Volume, Channel A, Taps @ 180K, 350K
B	500K	½						Volume, Channel B, Taps @ 150K, 300K
C	Switch							
R2	500K	½	R663-131					Stereo Balance
R3A	1meg	½	R663-134	BB-107	AD47-1meg-Z	Q13-137		Bass, Channel A, Tap @ 100K, Not used
B	1meg	½		Not Req.	Not Req.	M13-137	■ UE3913	Bass, Channel B, Tap @ 100K, Not used
C	Shaft			Not Req.	FS-3	Not Req.		
R4A	1meg	½	R663-134	BB-107	AD47-1meg-Z	Q13-137		Treble, Channel A, Tap @ 100K, Not used
B	1meg	½		Not Req.	Not Req.	M13-137	■ UE3913	Treble, Channel B, Tap @ 100K, Not used
C	Shaft			Not Req.	FS-3	Not Req.		
R5A	50K	½	R50103-3	BX-31	A47-50K-S	Q11-123	SU-35	Phase Inverter, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R6A	50K	½	R50103-3	BX-31	A47-50K-S	Q11-123	SU-35	Phase Inverter, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R7	250K	1/10	R657-134	JP-254	48M-250K-S			Aux. Level Set, Chan. A
R8	250K	1/10	R657-134	JP-254	48M-250K-S			Aux. Level Set, Chan. B
R9	250K	1/10	R657-134	JP-254	48M-250K-S			Tape-Phono Level Set, Chan. A
R10	250K	1/10	R657-134	JP-254	48M-250K-S			Tape-Phono Level Set, Chan. B

■ "STA-LOC" Equivalent: FA16A, RU16A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R11	22Ω		RC20BF220K	①
R12	10K		RC20BF103K	
R13	150K		RC20BF154K	
R14	2700Ω	1	RC30BF272K	
R15	2.2meg		RC20BF225K	②
R16	270K		RC20BF274K	
R17	1.2meg		RC20BF125K	
R18	10meg		RC20BF106K	
R19	120K		RC20BF124K	
R20	10meg		RC20BF106K	

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R21	3.3meg		RC20BF335K	
R22	220K		RC20BF224K	
R23	330K	1	RC30BF334K	
R24	2.2meg		RC20BF225K	
R25	3.3meg		RC20BF335K	
R26	100K		RC20BF104K	
R27	15meg		RC20BF156K	
R28	180K		RC20BF184K	
R29	1200Ω		RC20BF122K	
R30	220K		RC20BF224K	

PARTS LIST AND DESCRIPTIONS (Con't)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R31	15K		RC20BF153K	
R32	47K		RC20BF473K	
R33	100K		RC20BF104K	
R34	1200Ω		RC20BF122K	
R35	120K		RC20BF124K	
R36	47K		RC20BF473K	
R37	270K		RC20BF274K	
R38	68K		RC20BF683K	
R39	390K		RC20BF394K	
R40	47K		RC20BF473K	
R41	1500Ω		RC20BF152K	
R42	100K		RC20BF104K	
R43	82K		RC20BF823K	
R44	470K		RC20BF474K	
R45	2200Ω		RC20BF222K	
R46	470K		RC20BF474K	
R47	33K		RC20BF333K	
R48	22Ω		RC20BF220K	①
R49	10K		RC20BF103K	
R50	150K		RC20BF154K	
R51	2700Ω	1	RC30BF272K	
R52	2.2meg		RC20BF225K	
R53	270K		RC20BF274K	
R54	10meg		RC20BF106K	
R55	120K		RC20BF124K	
R56	10meg		RC20BF106K	
R57	3.3meg		RC20BF335K	
R58	220K		RC20BF224K	
R59	330K	1	RC30BF334K	
R60	2.2meg		RC20BF225K	

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R61	3.3meg		RC20BF335K	
R62	100K		RC20BF104K	
R63	15meg		RC20BF156K	
R64	180K		RC20BF184K	
R65	1200Ω		RC20BF122K	
R66	220K		RC20BF224K	
R67	15K		RC20BF153K	
R68	47K		RC20BF473K	
R69	100K		RC20BF104K	
R70	1200Ω		RC20BF122K	
R71	120K		RC20BF124K	
R72	47K		RC20BF473K	
R73	270K		RC20BF274K	
R74	68K		RC20BF683K	
R75	390K		RC20BF394K	
R76	1500Ω		RC20BF152K	
R77	47K		RC20BF473K	
R78	100K		RC20BF104K	
R79	82K		RC20BF823K	
R80	470K		RC20BF474K	
R81	2200Ω		RC20BF222K	
R82	470K		RC20BF474K	
R83	33K		RC20BF333K	
R84	920Ω	5	R592-167	
R85	47K		RC20BF473K	
R86	10K	1	RC30BF103K	
R87	4700Ω	1	RC30BF472K	
R88	2200Ω	7	R563-148	
R89	115Ω	7	R563-205	

① Not used in some versions.
② Some versions may use 3.3meg in this application (Part #RC20BF335K).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.4A	770VCT ② .190A	5V ② 3A	T663-115						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT ② 4.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7500Ω CT	16Ω Tap ② 8Ω, 4Ω	T663-135							
T3	7500Ω CT	16Ω Tap ② 8Ω, 4Ω	T663-114							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA FISHER PART No. FUSE	FISHER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3 2/10A 125V S/B	F3319		31303.2 (3 2/10A 125V S/B)	342012	MDX3 2/10	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M2	Lamp	A5018	6.3V (JALUX)
	Lamp	I588-120	(Used in early versions)
M3	Switch	S663-132	Input Selector (8 Position, Rotary Wafer Type)
M4	Switch	S663-130	Output Selector (4 Position, Rotary Wafer Type)
M5	Switch	S663-133	Rumble Filter On-Off (SPDT, Slide Type)
M6	Switch	S663-133	Loudness Contour On-Off (SPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

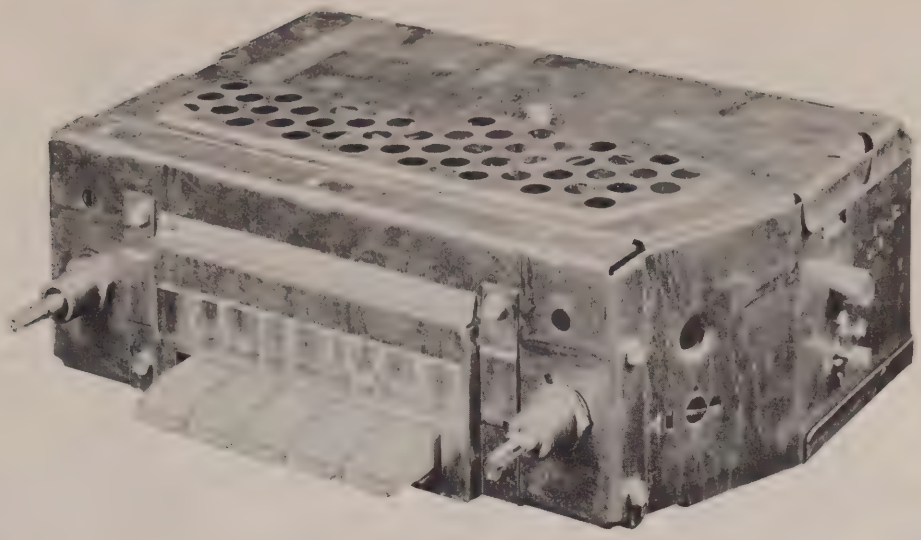
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder with CIRCUITRACE*

FORD MODEL 94BF (B9A-18805-A, B9AF-18806-D)

FORD MODEL
94BF (B9A-18805-A, B9AF-18806-D)



TRADE NAME	Ford Model 94BF (B9A-18805-A, B9AF-18806-D) For 1959 Ford Automobiles
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Maryland
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1 Amp@12.6 Volts DC
TUNING RANGE—BROADCAST	535 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set Volume Control fully counterclockwise.
Set Tone Control fully clockwise.
Suggested alignment tools:
A1, A2, A3, A4..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8, A9, A10..... GENERAL CEMENT #9050L, 9150
WALSCO #2521

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400~ Mod.)	High Freq. end stop	DC probe to point A. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Fig. 1	Thru dummy antenna to antenna receptacle	1605KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuning cores or coils have been replaced or tuner has been tampered with. If necessary, back tuning cores (A8, A9, A10) out of coils but not out of coil forms. Repeat Step 2.						
3.	Fig. 1	Thru dummy antenna to antenna receptacle	1180KC	Tuner carriage .285" from high Freq. End Stop	DC probe to point A. Common to chassis.	A8, A9, A10	Adjust for maximum output. Repeat steps 2 & 3 until no further improvement is noted. Cement cores.
	With radio installed in car and antenna fully extended, tune in a weak station near 1600 KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT
1. Tune manually to desired station.
2. Pull button out, then press in firmly.
3. Repeat for remaining buttons.

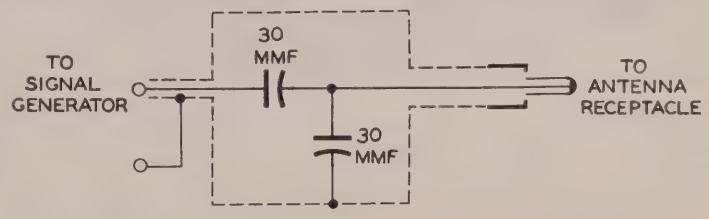


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J89

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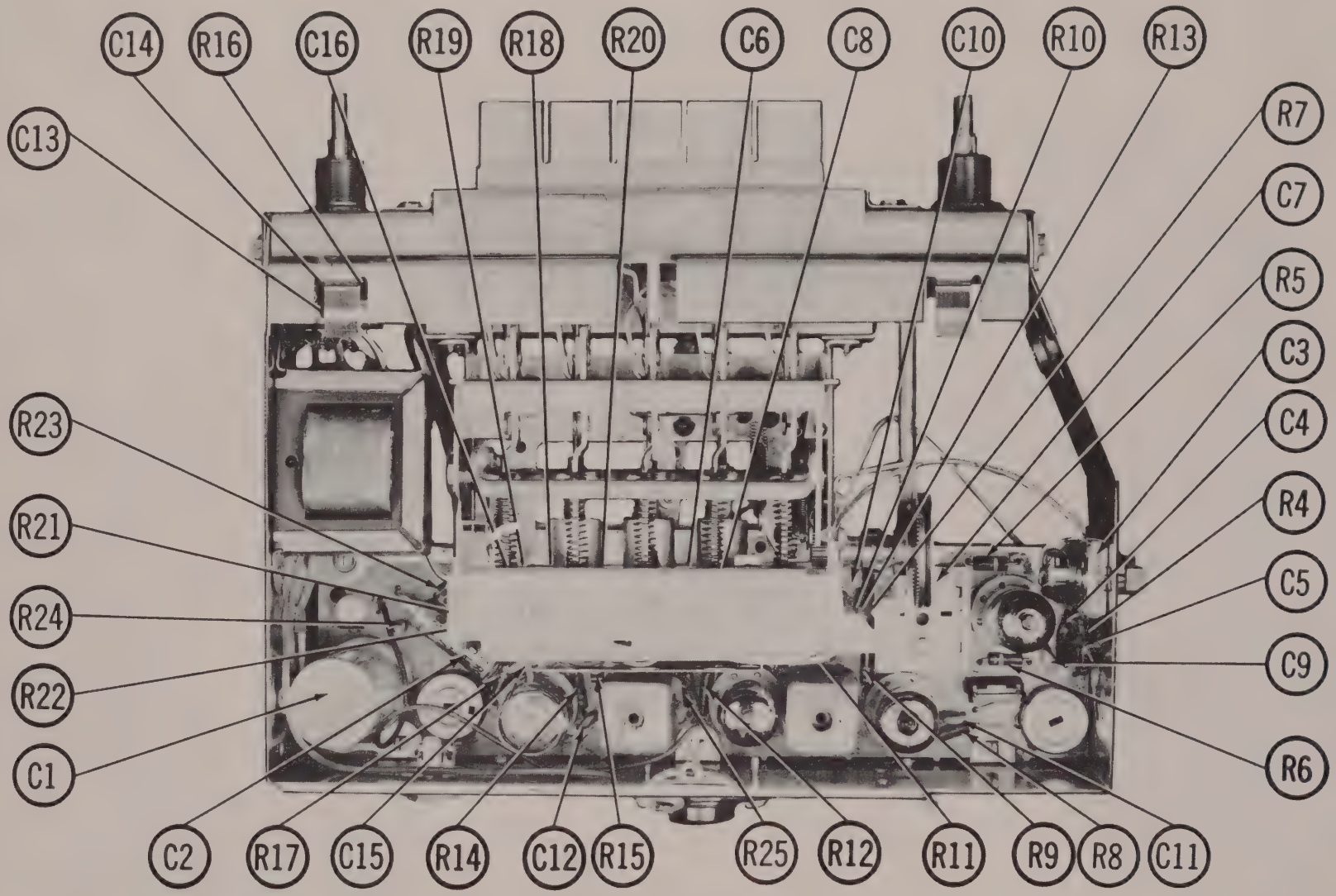
SET 446 FOLDER 8



CHASSIS TOP VIEW - CAPACITOR & RESISTOR IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	

ITEM No.	USE	TYPE	NOTES
V3	IF Amplifier	12EK6	
V4	Det.-AVC-AF Amp.	12FK6	①

① Alternate 12FM6

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1008	AF Amp.			2N1008		PNP
X2	2N1007	Output					PNP Note 1

Note 1. When replacing, apply silicone grease to both sides of the insulator.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	16	220353-12	AFH2-02-75	B0045 †	PWP200-6		PCLS-2175 *	
B	▲100	16							
C2	50	16	2090480-1	SRE25V50	BBR50-25	TC29	TD-50-25	TVA-1206	

† Use Printed Circuit Adapters #55277 & 55278
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	4-75			219083-1						
C4	150			220350-601	1468-00015	DD-151	5W5T15	MC236	1FM-315	
C5	33			220332-35	BPD-000033	DD-330	L10Q33	UC-433	5GA-Q33	
C6	.1	100		220352-11	P288N-1	DF-104	STM1P1	BT-010	2TM-P1	
C7A	120-450			219092-2						
B	370-445									
C	100									
C8	.1	100		220352-11	P288N-1	DF-104	STM1P1	BT-010	2TM-P1	
C9	470			220332-38	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C10	51		N750 10%	220332-16		TCN-51	C10Q51U		5TCU-Q51S 10%*	
C11	1000			220332-48	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	22		N750	220332-61	N750-D1 22	TCN-22	C10Q22U	CN7-422	5TCU-Q22	
C13	1800			2090058U-182M		DD-182	L10D18	B-218	5GA-D18	
C14	3900			2090058U-392M	BPD-004	DD-392	L10D39	B-240	5GA-D39	
C15	.01	100		2090207-9	P285N-01	DD-103	STM1P1	BT-110	5HK-S1	
C16	1mfd			2090150-1					2WF-M1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

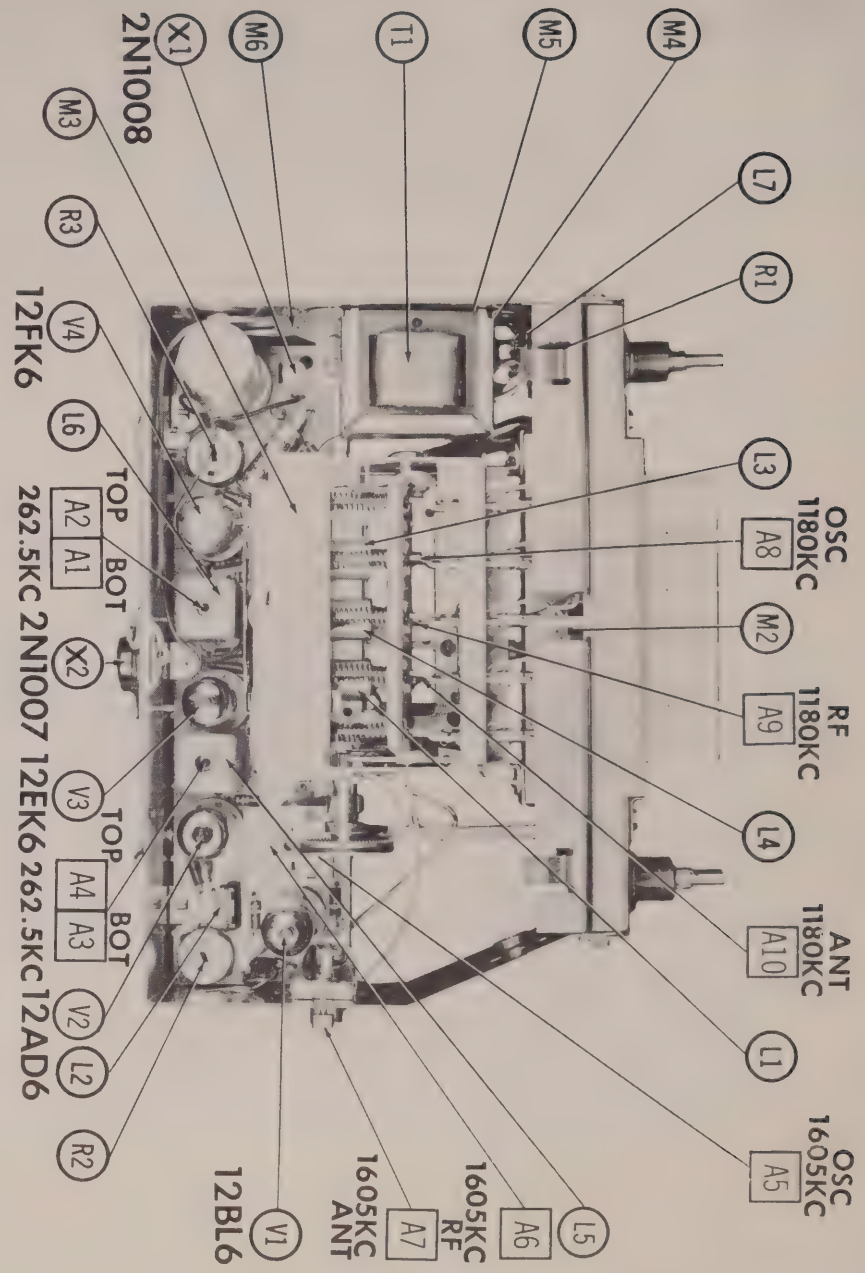
CONTROLS

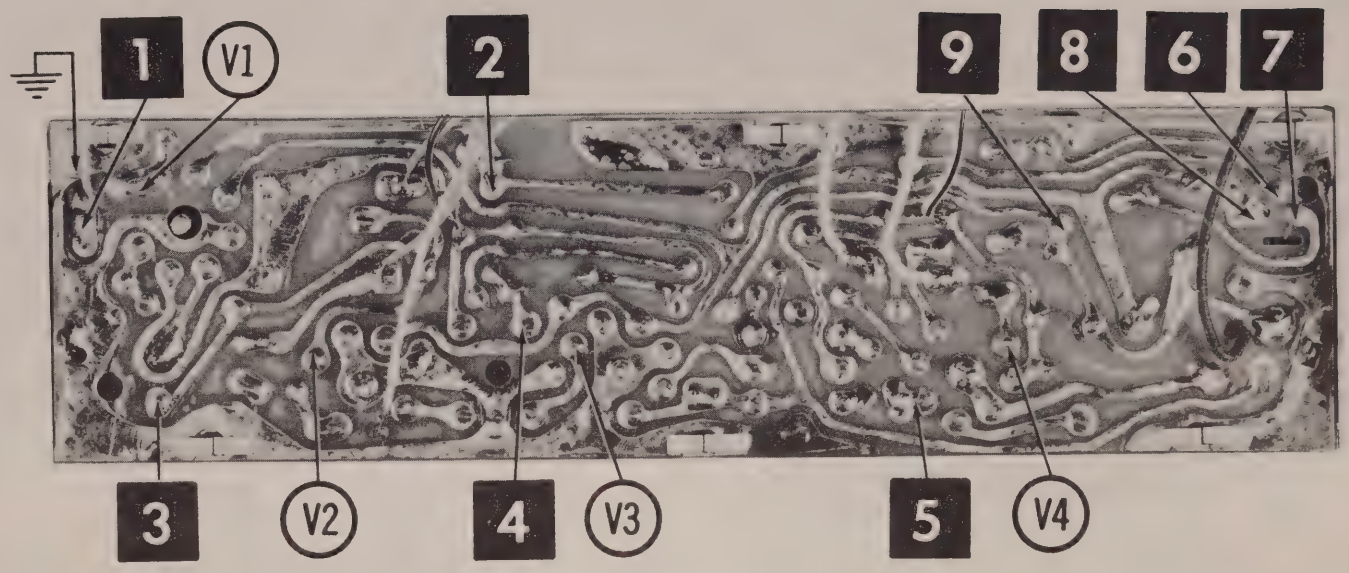
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg	½	2090035-3	F1-82		† QJ998	†† UE3961S	Tone
B	2meg			R2-72				Volume, Tap at 1meg
C	Switch			KR-4				
R2	600Ω	1(ww)	2090181-2				FL-600	Sensitivity
R3	1.5Ω	1(ww)	2090181-7				PFL1.5	Bias

† "Concentrikit" equivalent; K-6 kit, with base elements & shafts: B11-141, P14-029 (Panel)
B18-139X, R1-113 (Rear)
76-1 (Switch)

†† "STA-LOC" equivalent: FA46L, OS937, RU26X16, IS1437, US-41

CHASSIS—TOP VIEW





A Howard W. Sams CIRCUITRACE* Photo

*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PARTS LIST AND DESCRIPTIONS (cont)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	BENDIX PART No.	NOTES
R4	680K		220604B-684	
R5	220K		220604B-224	
R6	680Ω		220604B-681	
R7	1500Ω		220604B-152	
R8	1meg		220604B-105	
R9	33K		220604B-333	
R10	33meg		220604B-336	
R11	47meg		220604B-476	
R12	150Ω		220604B-151	
R13	22meg		220604B-226	
R14	3.3meg		220604B-335	
R15	150K		220604B-154	
R16	100K		220604B-104	
R17	4.7meg		220604B-475	
R18	2200Ω		220604B-222	
R19	39K		220603B-393	
R20	680Ω		220604B-681	
R21	6800Ω		220603B-682	
R22	150Ω		220604B-151	
R23	220Ω		220604B-221	
R24	150Ω(cold)		220629-9	
R25	68Ω		22604B-680	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BENDIX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	†						
L2	RF Choke	*						
L3	RF Coil	†						
L4	Osc. Coil	†						
L5	Input IF	2090907-2						
L6	Output IF	2090908-3						
L7	"A" Lead Choke	216188-11						130uh

† Part of Tuner Coil Ass'y. Part #2090131-1 (RCC) or 2090131-14 (Oak), or Tuner M3.
* In some versions, L2 may be wound on 18K resistor (Part #2090088-1).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	8Ω Tap @ 3-4Ω	2090038-3							

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA BENDIX PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	4Ω	282634-3	69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BENDIX PART No. FUSE	BENDIX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	1AG	5A 32V	AGA-5	2090932-2 2090717-1 (cap)	301005. (1AG 5A 32V)	155004	SFE4	HAF

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Lamp	1892	#1892
M3	Tuner Ass'y.	2090102-3	Complete
M4	Spark Plate	220267-14	185mmf
M5	Spark Plate	220267-14	185mmf
M6	Spark Plate	220267-9	200mmf
	Printed Board Ass'y	2090264-1	Less Driver (X1)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

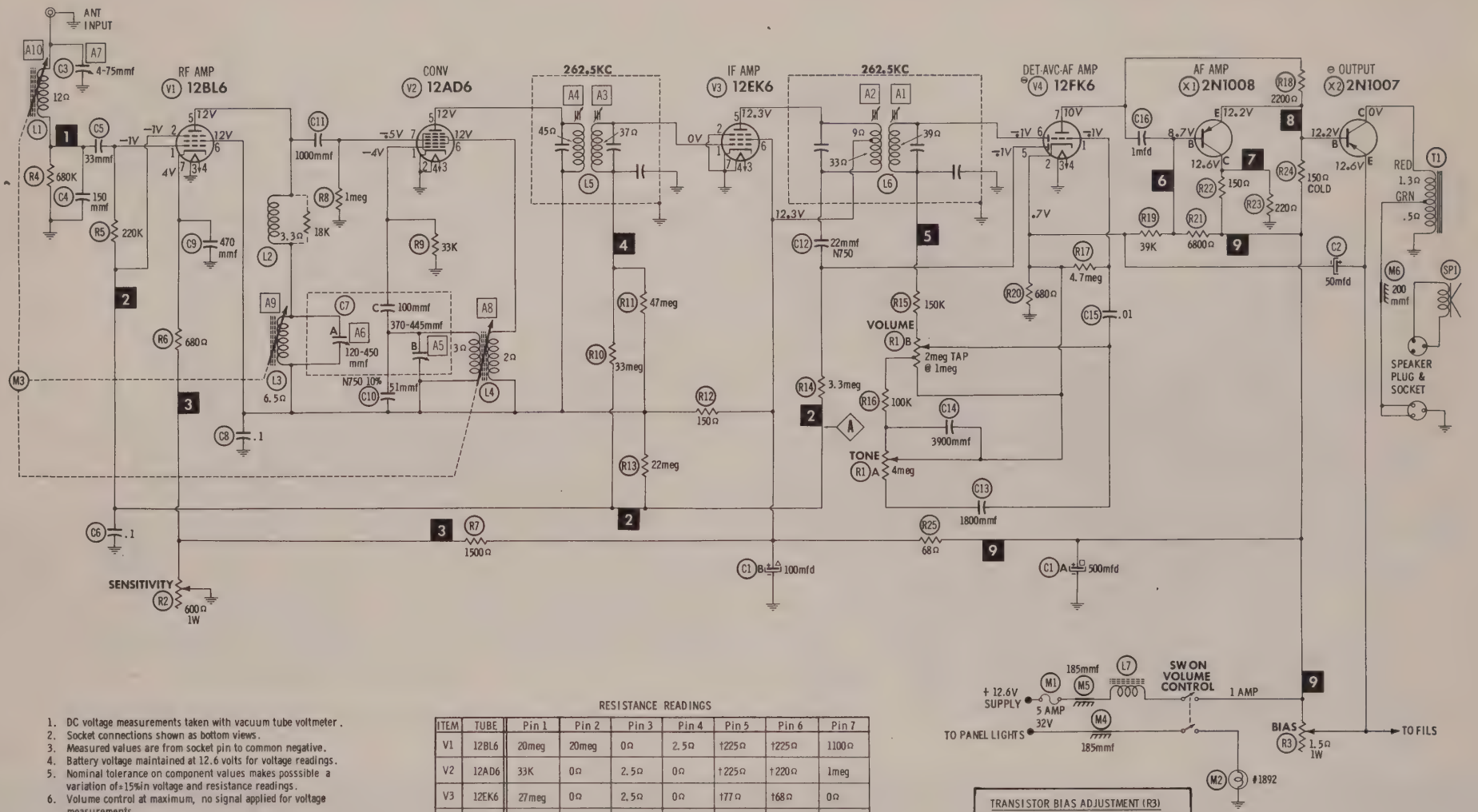
NAME	PART NO.	DESCRIPTION
Bezel	2090243-1	
Knob Ass'y.	2090016-3	Tuning, Volume-On-Off
Disc	2090007-1	Tone, 2 Used
Top Cover	2090055-1	
Bottom Cover	2090084-2	
Pushbutton	686576-3	
Pointer Assembly	2090129-1	(RCC)
Pointer Assembly	2090129-11	(OAK)
Dial	676312-3	Calibrated
Sub Dial	686553-3	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Bonding Strap ..... Use BELDEN No. 8661



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	20meg	20meg	0Ω	2.5Ω	†225Ω	†225Ω	1100Ω
V2	12AD6	33K	0Ω	2.5Ω	0Ω	†225Ω	†220Ω	1meg
V3	12EK6	27meg	0Ω	2.5Ω	0Ω	†77Ω	†68Ω	0Ω
V4	12FK6	4.7meg	680Ω	0Ω	2.5Ω	22meg	2meg	†2300Ω

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

† MEASURED FROM POSITIVE TERMINAL OF C1A

TRANSISTOR BIAS ADJUSTMENT (R3)

Connect a low resistance 0 500 ma meter in series with transistor collector terminal. Turn receiver on and adjust Bias Control (R3) for a current reading of approximately 420 ma. Allow receiver to operate at least 15 minutes. Set DC supply for 14.4 volts. Retouch Bias control for 420 ma.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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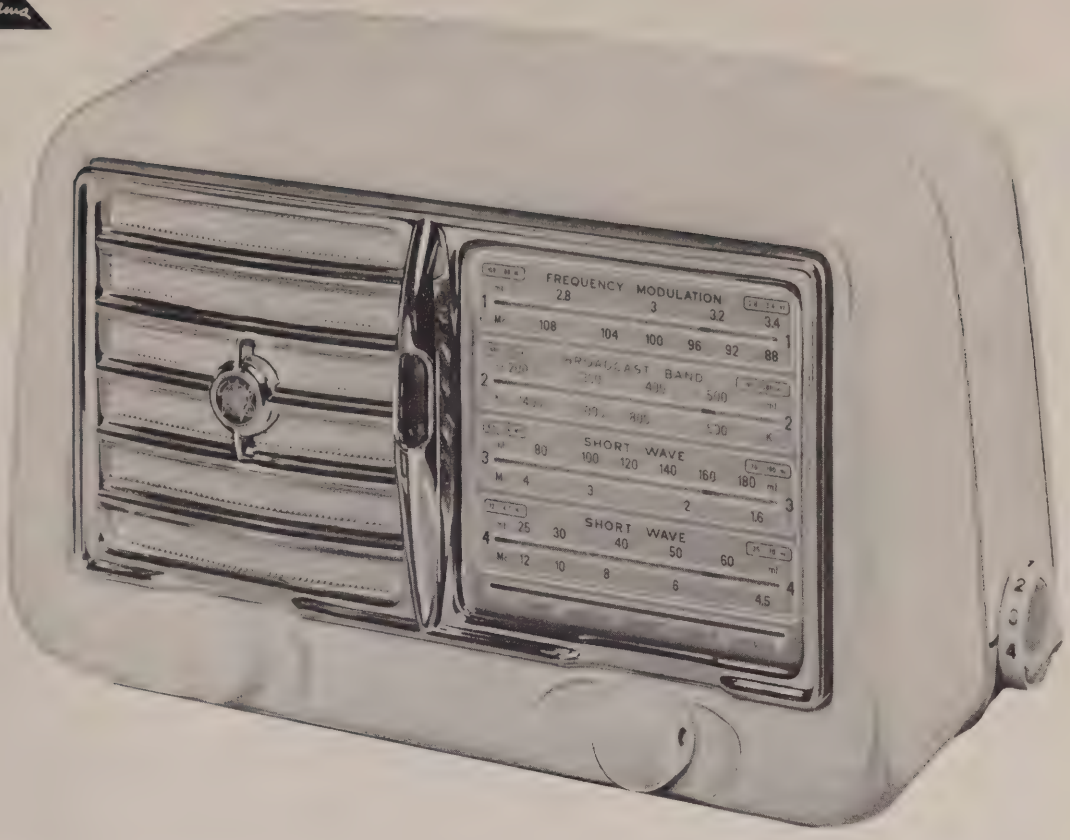
FORD MODEL
94BF (B9A-18805-A, B9AF-18806-D)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GELOSO
MODEL G-307

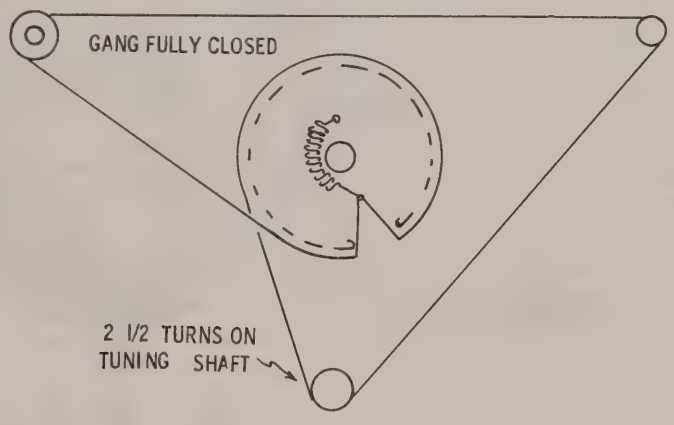
GELOSO
MODEL G-307



GELOSO
MODEL G-307

TRADE NAME	Geloso Model G-307		
IMPORTER	American Geloso Electronics Inc., 312 Seventh Ave., New York 1, N. Y.		
TYPE SET	AC Operated 5 Tube FM - AM - SW Receiver		
POWER SUPPLY	110 - 125 Volts AC, 50-60 Cycles	RATING	38 Watts, .44 Amp. @117 Volts AC (FM)
TUNING RANGE — BROADCAST	520 - 1600KC	SHORT WAVE	1.6 - 4.5MC
FREQ. MOD.	88 - 108MC		4.5 - 12MC

DIAL CORD STRINGING



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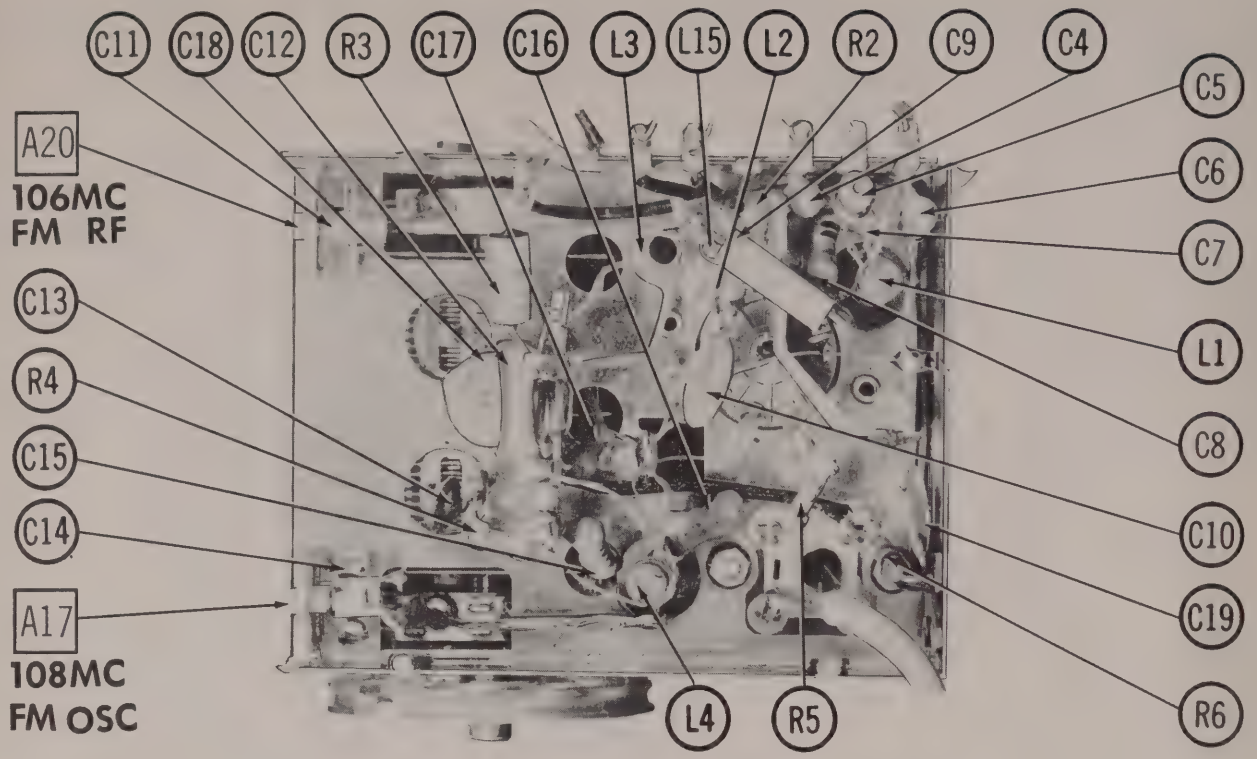
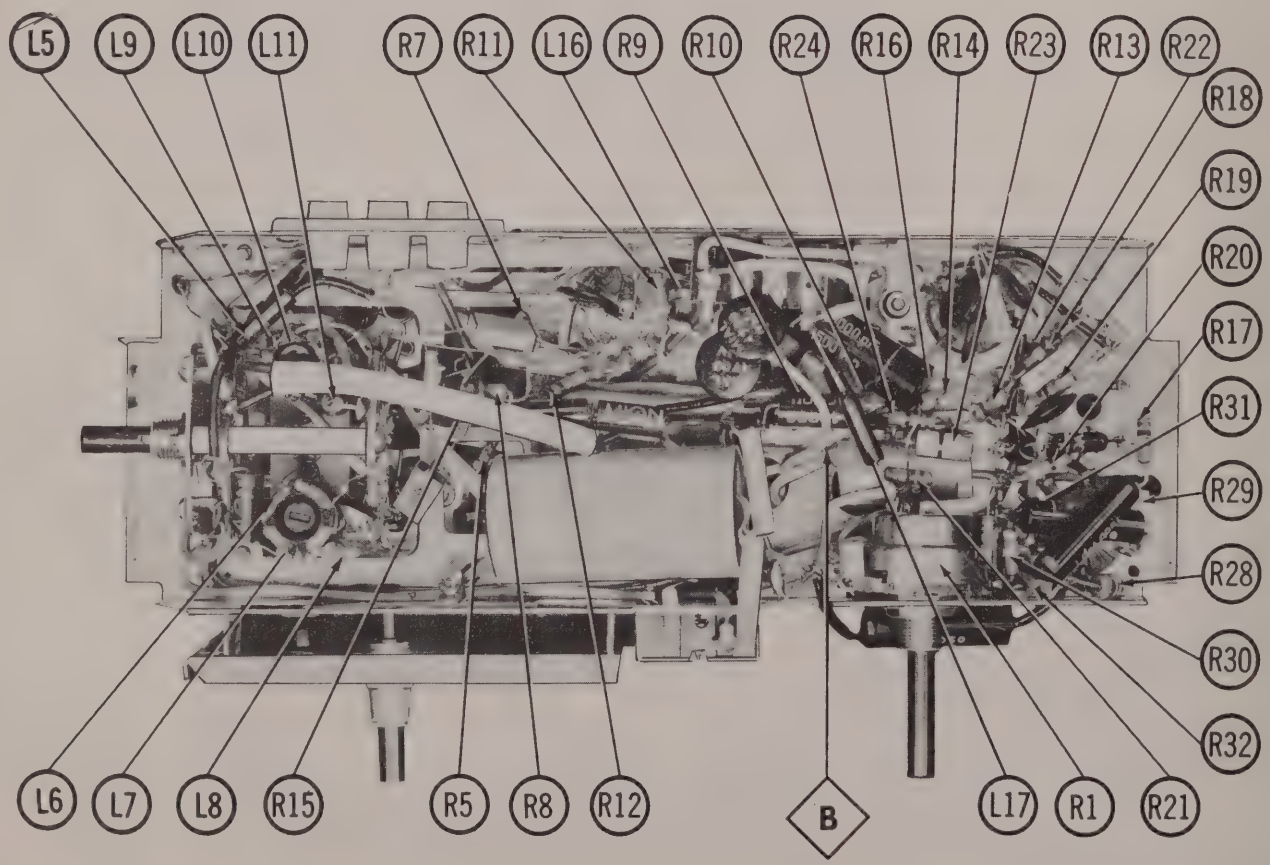
H982

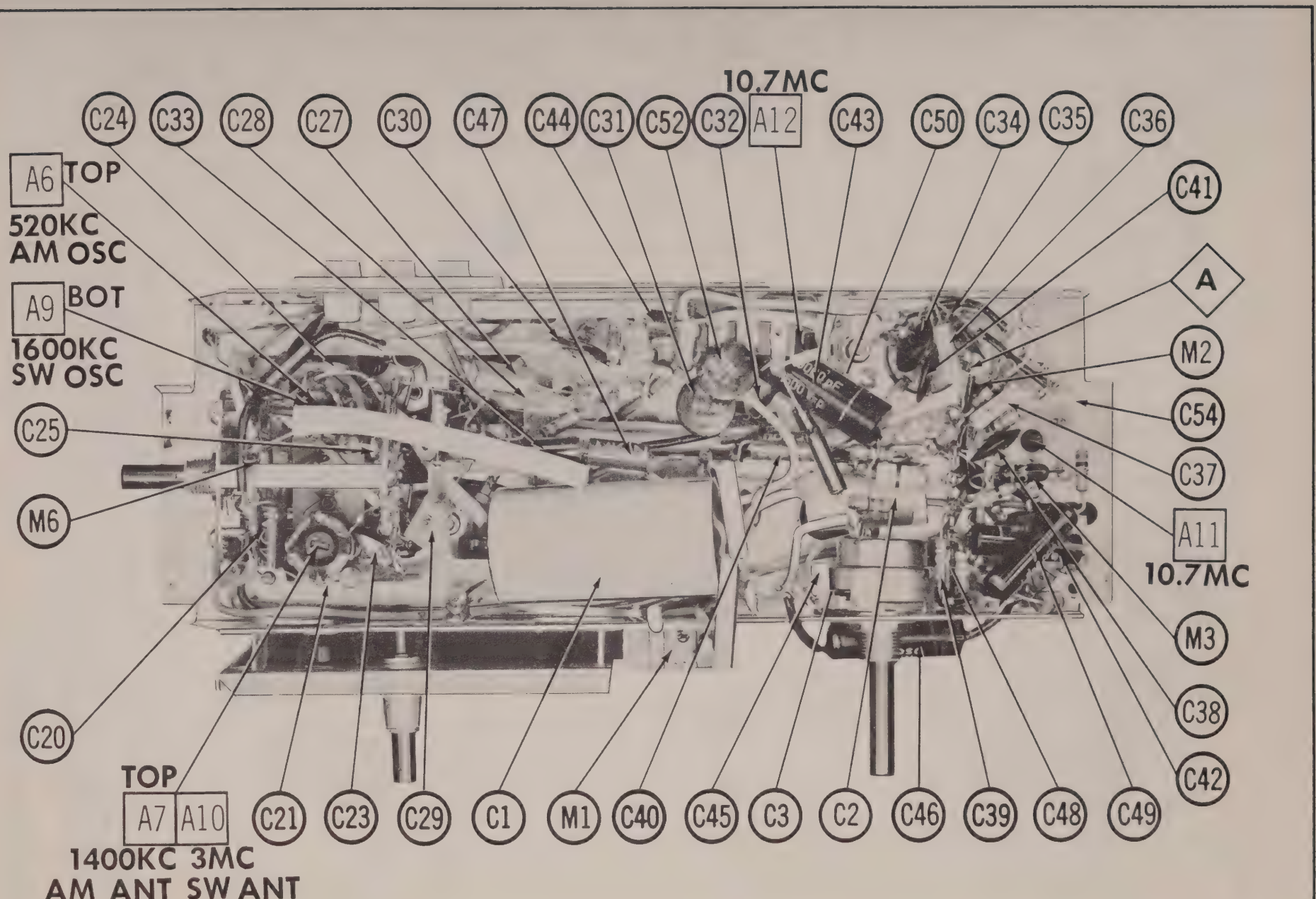
SET 446 FOLDER 9



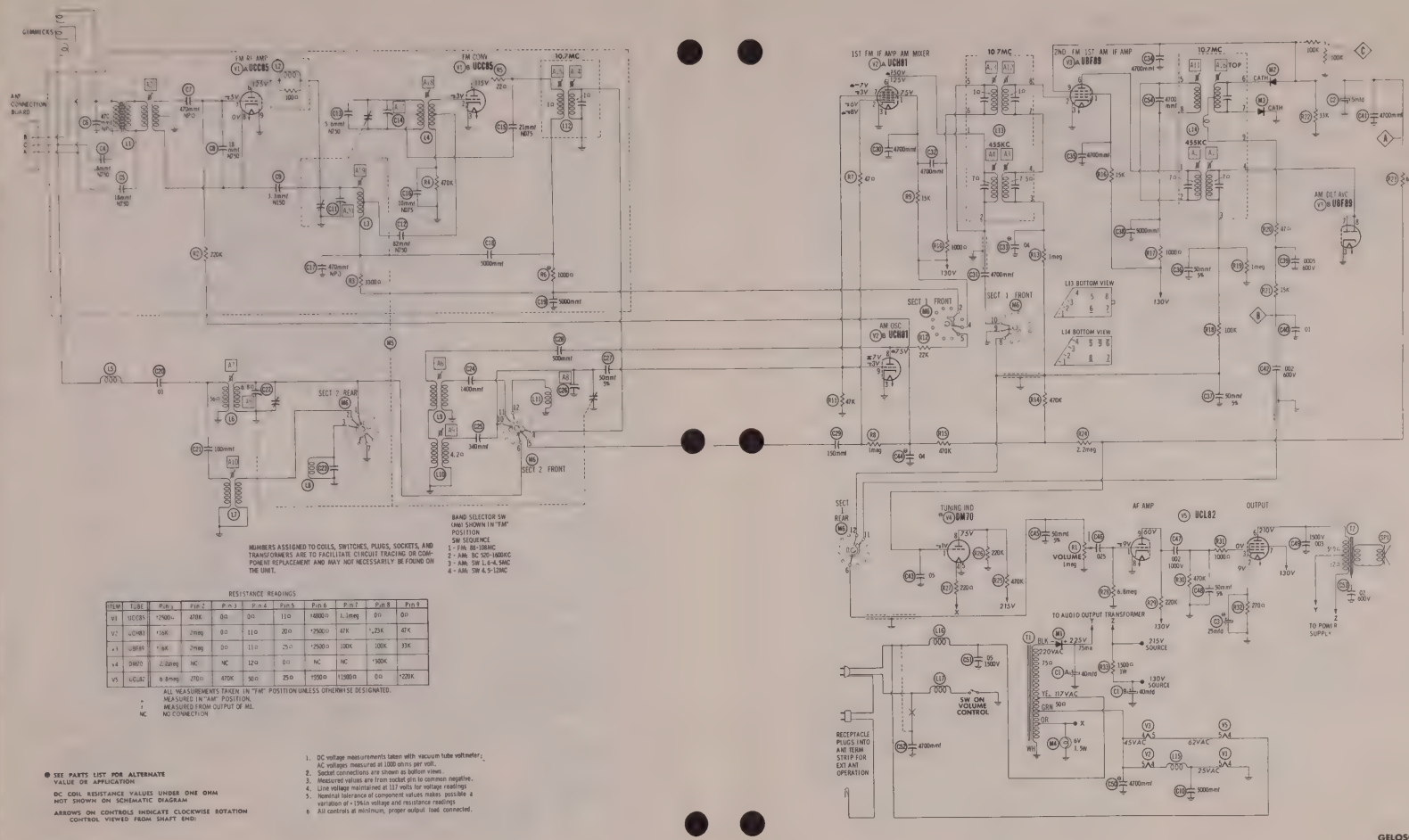
FM RF SUB-CHASSIS



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW - CAPACITOR, MISC, & ALIGN IDENT



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	UCC85	*2900Ω	470K	0Ω	0Ω	110	14000Ω	1.1meg	0Ω	0Ω
V2	UCH81	16K	2meg	0Ω	110	20Ω	*2500Ω	47K	*.25K	47K
V3	UBF89	16K	2meg	0Ω	110	25Ω	*2500Ω	100K	100K	33K
V4	DM70	2.2meg	NC	NC	12Ω	0Ω	NC	NC	*300K	
V5	UCL82	6.8meg	270Ω	470K	50Ω	25Ω	*350Ω	†1500Ω	0Ω	*220K

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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GELOSO MODEL G-307

GELOSO MODEL G-307

FOLDER 9

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A1 thru A4, A6, A8, A9 thru A16 . . . . GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A7, A17 thru A21 . . . . . GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of UCH 81 (V2). Low side to chassis.	455KC (400∿ Mod.)	2 (BC)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	520KC	"	Tuning gang closed	"	A6	"
4.		"	1400KC	"	1400KC	"	A7	"
5.		"	4.5MC	3 (SW)	4.5MC	"	A8	"
7.		"	1600KC	"	1600KC	"	A9	"
8.		"	3.0MC	"	3.0MC	"	A10	Adjust for maximum output. Repeat steps 2 thru 8.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	.01mfd	High side to FM RF stator on tuning gang. Low side to chassis.	10.7MC (Unmod.)	1 (FM)	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A11, A12, A13, A14 A15	Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	.01mfd	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (450 KC Swp)	1 (FM)	Point of non-interference	Vert. amp. to point Ⓐ. Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
10.	"	"	"	"	"	Vert. amp to point Ⓑ. Low side to chassis.	A16	Reconnect syabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	High side thru 270Ω to antenna terminal B . Low side to chassis.	108MC (Unmod.)	1 (FM)	108MC	DC probe to point Ⓐ. Common to chassis.	A17	Adjust for maximum deflection.
12.	"	"	88MC	"	88MC	"	A18	Adjust for maximum deflection. Repeat steps 11 and 12.
13.	"	"	90MC	"	90MC	"	A19	Adjust for maximum deflection.
14.	"	"	106MC	"	106MC	"	A20	"
15.	"	"	90MC	"	90MC	"	A21	"

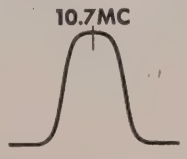


FIG. 1

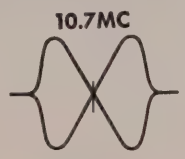


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -FM Conv.	UCC85	
V2	1st FM IF Amp. -AM Mixer-AM Osc.	UCH81	
V3	2nd FM-1st AM IF Amp. AM Det. -AVC	UBF89	
V4	Tuning Indicator	DM70/1M3	
V5	AF Amp. -Output	UCL82	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	GELOSO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	250	4170	PRS250V3030	BBRT4425C		TDLD-22	TVAS-2584*	
B	40	250							
C2	5	50	1242	PRS50V5	BBR5-50	TT50X5	TD-5-50	TVA-1303	
C3	25	30	4003 ①	SRE50V25	BBR25-50	TC36	TD-25-50	TVA-1306	

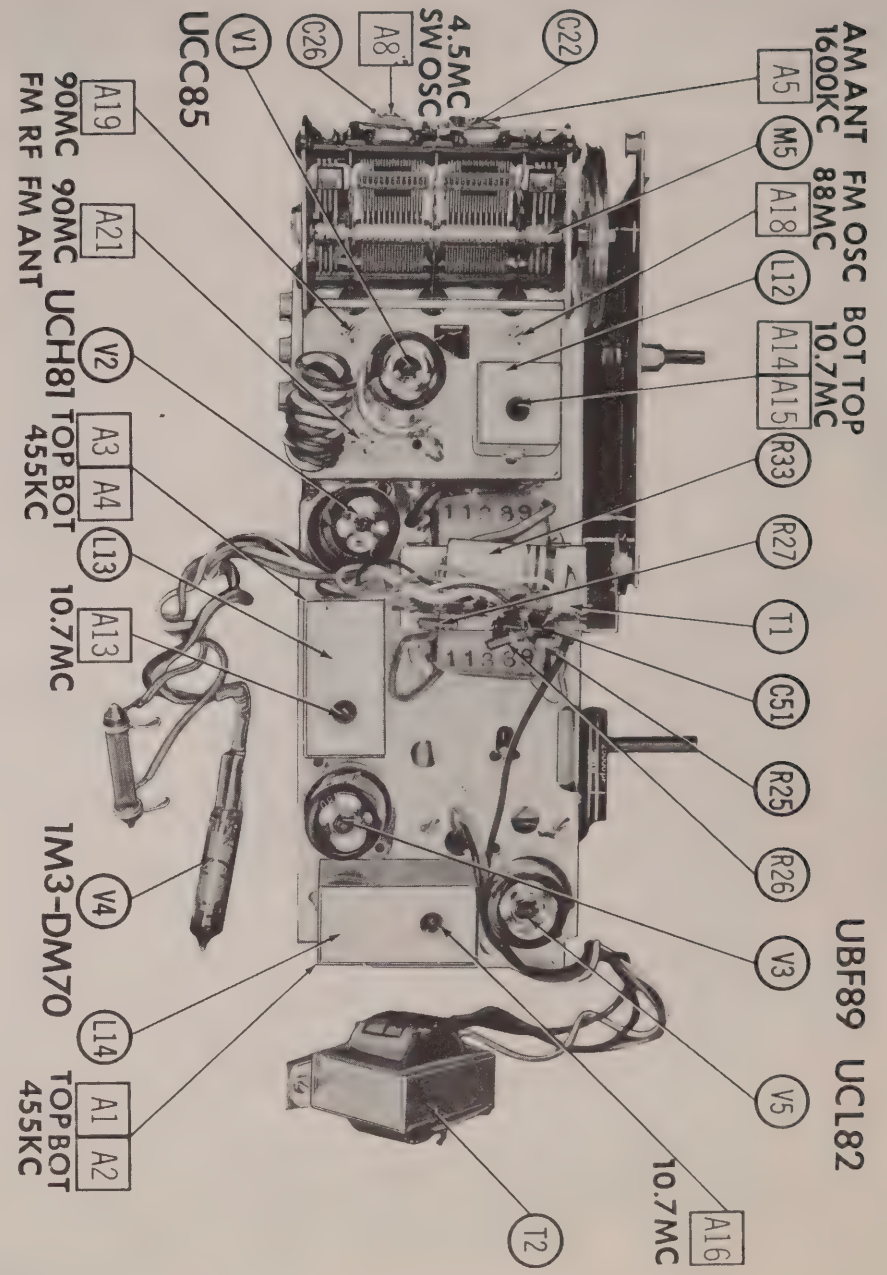
① Alternate Part #1240
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	GELOSO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	18		N750		N750-SI 18	TCN-18	CTA6Q18U	CN7-418	5TCU-Q18S *	
C5	18		N750		N750-SI 18	TCN-18	CTA6Q18U	CN7-418	5TCU-Q18S *	
C6	470		NPO							
C7	470		NPO							
C8	18		N750		N750-SI 18	TCN-18	CTA6Q18U	CN7-418	5TCU-Q18S *	
C9	3.3		N150							
C10	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C11										
C12	82		N750		N750-SI 82	TCN-82	CTA6Q82U	CN7-482	5TCU-Q82S *	
C13	5.6		N750						5TCUB-V56S*	
C14										
C15	21		N075							
C16	10		N075							
C17	470		NPO							
C18	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C19	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C20	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C21	100				BPD-0001	DD-101	L10T1	UC-310	5GA-T1	
C22										
C23										
C24	1400				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C25	340				BPD-00033	DD-351	L10T35	B-333	5GA-T35	
C26										
C27	50		5%		1469-00005		22R5Q5	MCE225	MS-45	
C28	500				BPD-0005	DD-501	BYA10T5	B-350	5GA-T5	
C29	150				BPD-00015	DD-151	L10T15	B-315	5GA-T15	
C30	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C31	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C32	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C33	.04	150			P288N-04	DF-403	CUB6S4	GEM-414	6TM-S4	①
C34	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C35	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C36	50		5%		1469-00005	DTZ-50	22R5Q5	MCE225	MS-45	
C37	50		5%		1469-00005	DTZ-50	22R5Q5	MCE225	MS-45	
C38	5000				BPD-0005	DD-502	BYA10D5	B-250	5HK-D5	
C39	.0005	600			P688N-0005	D6-501	CUB10T5	B-350	6TM-T5	
C40	.01	400			P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C41	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C42	.002	600			P688N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C43	.05	200			P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C44	.04	150			P288N-04	DF-403	CUB6S4	GEM-414	6TM-S4	①
C45	50		5%		1469-00005	DTZ-50	22R5Q5	MCE225	MS-45	
C46	.025	250			P488N-025		CUB6D3	GEM-4125	6TM-D3	
C47	.002	1000			P1088N-002	D6-202	CUB10D2	GEM-1022	10TM-D2	
C48	50		5%		1469-00005		22R5Q5	MCE225	MS-45	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Con't)

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	TOL	GELOSO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49	.003	1500			P1688N-003	DD16-302	CUBI6D3	GEM-1623	MB-D3	
C50	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C51	.05	1500			P1684CM-05		CUBI6S5	GEM-1615	TR-15	
C52	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C53	.02	600			P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C54	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	

① Some versions may use .05mfd in some applications.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	GELOSO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	8987	AB-70	A47-1meg-Z	B13-137	U53	Volume
B	Shaft			AK-9	RS-3	PQ	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	GELOSO PART No.	NOTES
R2	220K			
R3	3300Ω			
R4	470K			
R5	22Ω			
R6	1000Ω			Note 1
R7	47Ω			
R8	1meg			
R9	15K			
R10	1000Ω			
R11	47K			
R12	22K			
R13	1meg			
R14	470K			
R15	470K			
R16	15K			
R17	1000Ω			

ITEM No.	RATING OHMS	WATT	GELOSO PART No.	NOTES
R18	100K			
R19	1meg			
R20	47Ω			
R21	15K			
R22	33K			
R23	6.8meg			
R24	2.2meg			
R25	470K			
R26	220K			
R27	220Ω			
R28	6.8meg			
R29	220K			
R30	470K			
R31	1000Ω			
R32	270Ω			
R33	1500Ω	1		

Note 1. Some versions may use 3300Ω in this application.

COILS (RF-IF)

ITEM No.	USE	GELOSO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.							
L2	RF Choke							3 turns on 100Ω
L3	FM RF Coil							
L4	FM Osc. Coil							
L5	AM Ant. Coil							
L6	AM Ant. Trans.							
L7	SW Ant. Trans.							
L8	RF Choke							4.4uh
L9	AM Osc. Coil							
L10	SW Osc. Coil							
L11	RF Choke		19-1003	19-1003	BC-564	4608		4uh
L12	1st FM IF Trans.	2713						
L13A	1st AM IF Trans.	2719						
B	2nd FM IF Trans.							
L14A	2nd AM IF Trans.	2720/A						
B	Ratio Detector							
L15	Fil. Choke	816	19-1003	19-1003	BC-564	4608		3.8uh
L16	Line Choke	816	19-1003	19-1003	BC-564	4608		3.8uh
L17	Line Choke	816	19-1003	19-1003	BC-564	4608		3.8uh

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	GELOSO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .44A (Input) 220V ⓐ .072A, Tap ⓐ 45V ①, 6.3V ⓐ 2.1A	11389						

① No current under normal operation.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	GELOSO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7800Ω Tap ⓐ 1000Ω	3-4Ω	12687							

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	GELOSO PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	SP101	4A1	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	GELOSO PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.072A	E250/C85 ①			SD-500 ② ③	2SR-10H1-RV ① 80SM ②④	① Selenium Type ② Silicon Type ③ Use 2 in series ④ Add 15Ω Series Res.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	GELOSO PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	0A79	A0/79	1N636	1N295	Ratio Detector (Pigtail)
M3	0A79	A0/79	1N636	1N295	Ratio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	GELOSO PART No.	NOTES
M4	Lamp		Phillips, 6 Volts, 1.50 Watts
M5	Tuning Cap.	824C	4 Gang (AM Sections: Ant. 18 - 386mmf, Osc. 9 - 375mmf)
M6	Switch		Function Selector, 3 Position, Rotary, Wafer Type

CABINETS & CABINET PARTS

NAME	PART NO.	DESCRIPTION	
Knob	74400	Tuning, Volume-On-Off	(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)
Knob	80158	Band	
Cabinet	55769	Includes Accessories And Small Plate	
Cover	74779		
Dial Scale	1618/240		
Scale	1618A	Complete With Pulley # 74388A	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder with CIRCUITRACE*

GENERAL ELECTRIC MODELS C440A, C441A

GENERAL ELECTRIC
MODELS C440A, C441A

MODEL C440A

TRADE NAME	General Electric Models C440A, C441A
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N. Y.
TYPE SET	AC Operated 5 Tube AM Receiver With Electric Clock
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	29 Watts, .30 Amp. @ 117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A5	"
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY

1. Remove time set knob.
2. Remove 2 screws from top of cabinet back.
3. Remove screw above AC receptacle.
4. Remove 2 screws holding AC interlock plate.
5. Disengage interlock. Open cabinet back.

NOTE: Set dial at 55 when replacing pilot lamp.

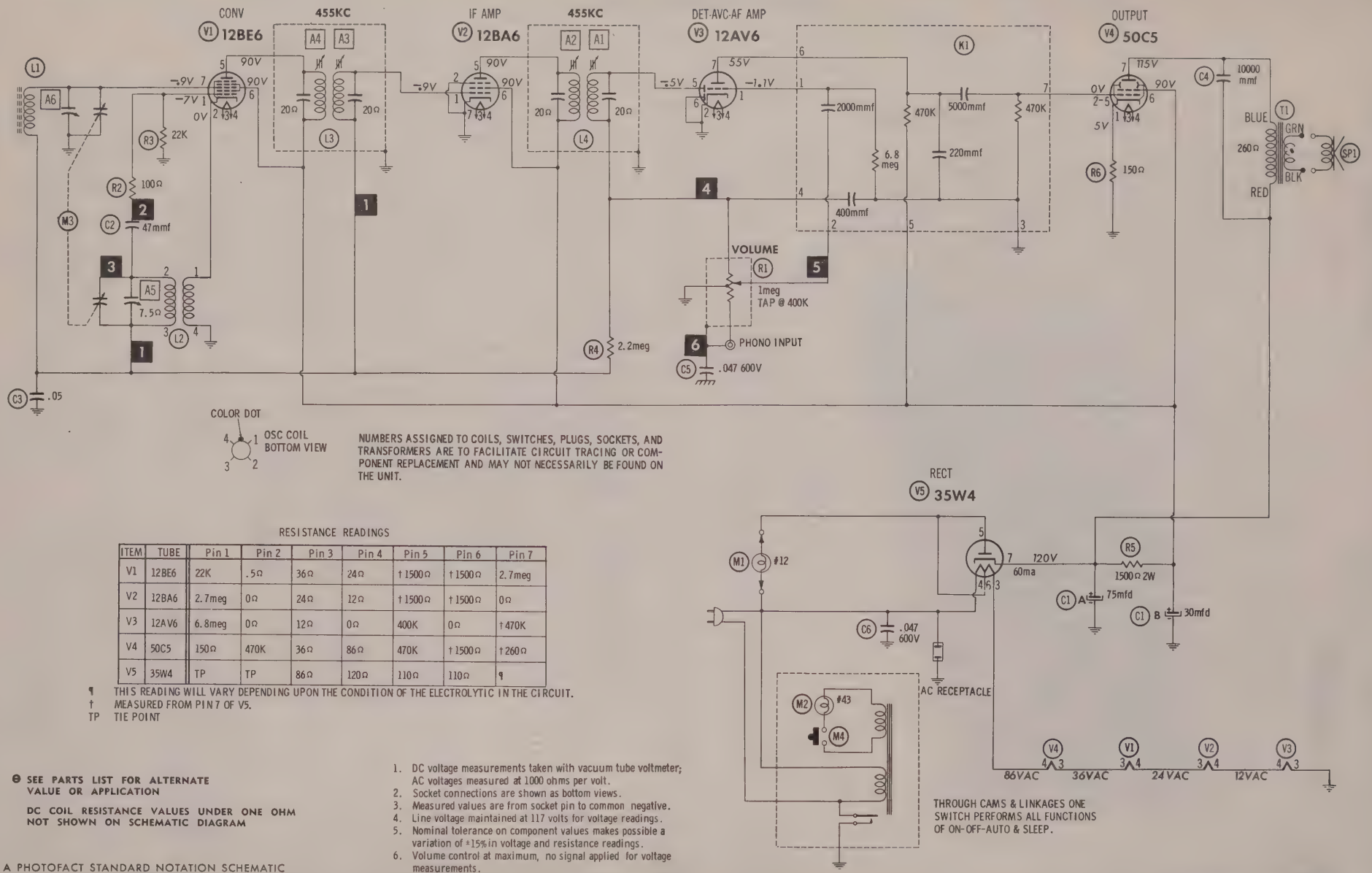
6. Remove tuning and volume knobs.
7. Unsolder speaker leads and green wire from upper right side of timer.
8. Remove 4 screws from cabinet bottom.
9. Remove chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J65

SET 446 FOLDER 10



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO & SLEEP.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.5Ω	36Ω	24Ω	†1500Ω	†1500Ω	2.7meg
V2	12BA6	2.7meg	0Ω	24Ω	12Ω	†1500Ω	†1500Ω	0Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	400K	0Ω	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1500Ω	†260Ω
V5	35W4	TP	TP	86Ω	120Ω	110Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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GENERAL ELECTRIC
MODELS C440A, C441A

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	75	150	RCE-215	PRS150V8040	BBRD8415	WD220	TDLD-10	VLS-2458.1 *	
B	30	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47				BPD-000047	DD-470	L10Q47	CNO-447	GTA-Q47	
C3	.05	200			P288N-05	DF-503	CUB2P5	GEM-415	2TM-S5	
C4	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C5	.047	600			P688N-047	DD-503	CUB6S47	GEM-6147	6TM-S47	
C6	.047	600			P688N-047	DD-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	RS-1568	BT-74	A47F5-1meg	Q19-137X	UT443	Volume, Tap ⓐ 400K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R2	100Ω			
R3	22K			
R4	2.2meg			

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R5	1500Ω	2		
R6	150Ω			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	G. E. PART No.	REPLACEMENT DATA
K1	Det. - Audio Coup. Net.	220mmf, 400mmf, 2000mmf, 5000mmf, 470K, 470K, 6.8meg	REK-011	Sprague DT-9

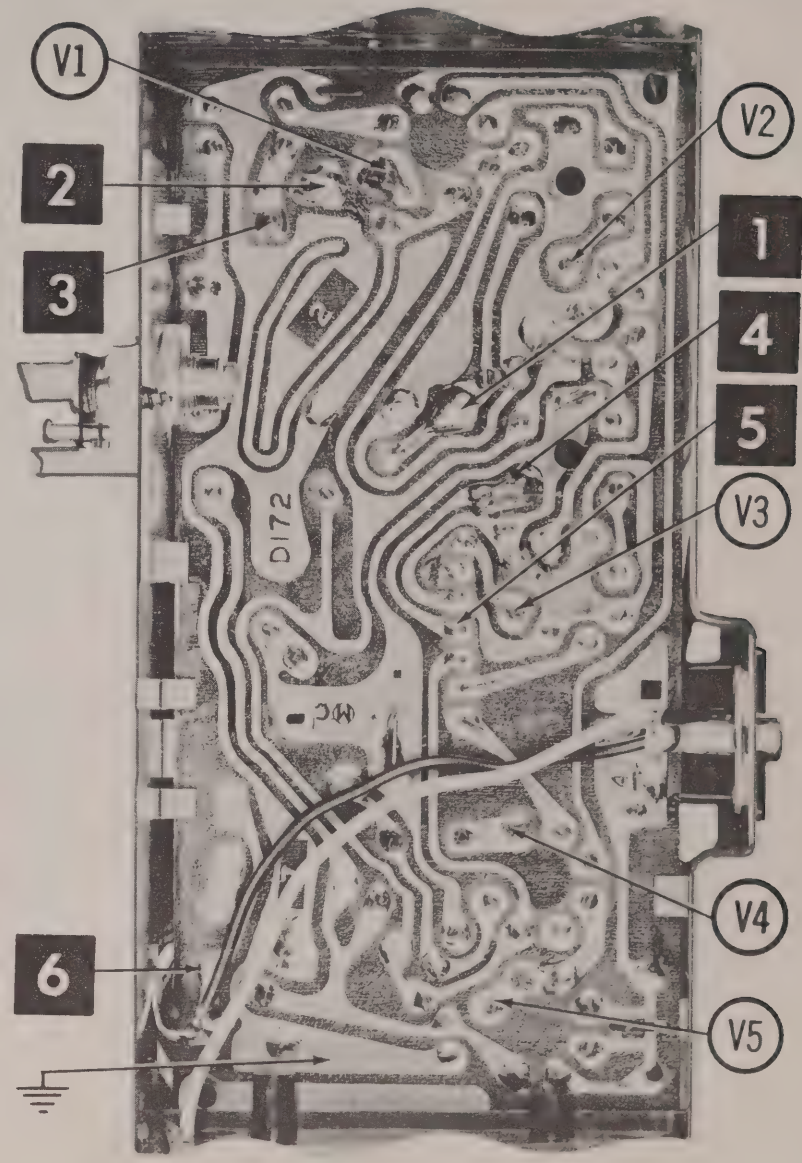
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		G. E. PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	RS-1564						
L2	Osc. Coil	RS-1437						
L3	Input IF	RS-1415	16-6780	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	RS-1415	16-6780	16-6780	BC-357	13-PC2	RF-4	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (cont)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	RS-1567	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	RB-1057	4A1	

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1	Lamp	RS-1323	#12 (Dial)
M2	Lamp	RS-1563	#43 (Night Light)
M3	Tuning Cap.	RS-1565	2 Gang
M4	Switch	RS-1656	Night Light (SPST, Push Type)

CABINETS & CABINET PARTS

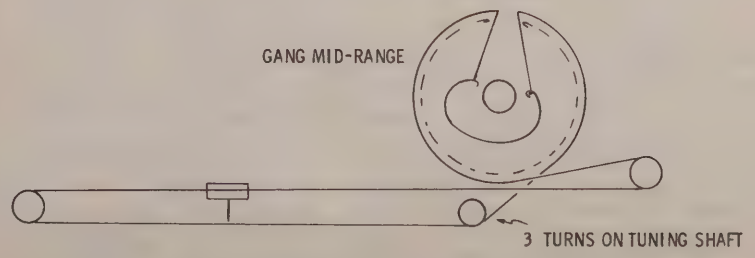
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RDK-425	Tuning, Volume
Knob	RS-1096	Timer, Lever Type
Knob	RS-1556	Snooz Alarm
Cabinet Assembly	RB-1080	Model C440A (Consists of Blue Front, White Back, Crystal, 2 Hinges, Backing and Reflector)
Cabinet Assembly	RB-1081	Model C441A (Consists of Black and Gold Front, White Back, Crystal, 2 Hinges, Backing and Reflector)
Pointer	RS-1560	
Window	RS-1558	Dial Backing
Crystal	RS-1528	Blue and Silver, Model C440A
Crystal	RS-1529	Black and Gold, Model C441A

WIRING DATA

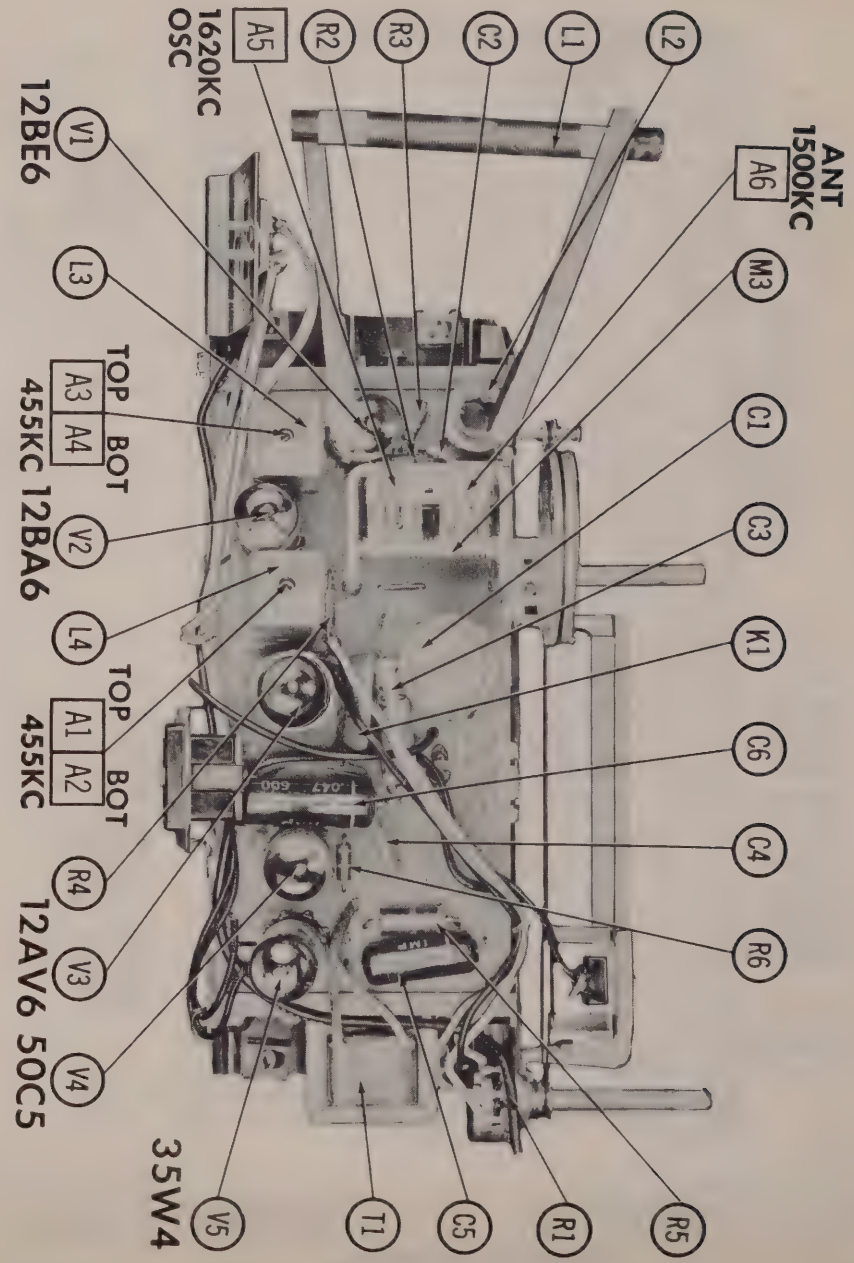
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874



DIAL CORD STRINGING

CHASSIS—TOP VIEW



PHOTOFACT* Folder with CIRCUITRACE*

HITACHI
MODEL TH-666

HITACHI
MODEL TH-666

HITACHI
MODEL TH-666

TRADE NAME	Hitachi Model TH-666
MANUFACTURER	Electronic Utilities Co., A Div. Of The Sampson Co., 2244 S. Western Ave., Chicago 8, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1605KC
RATING	4.4MA@9 Volts DC (No Signal Min. Volume) 6.5MA@9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

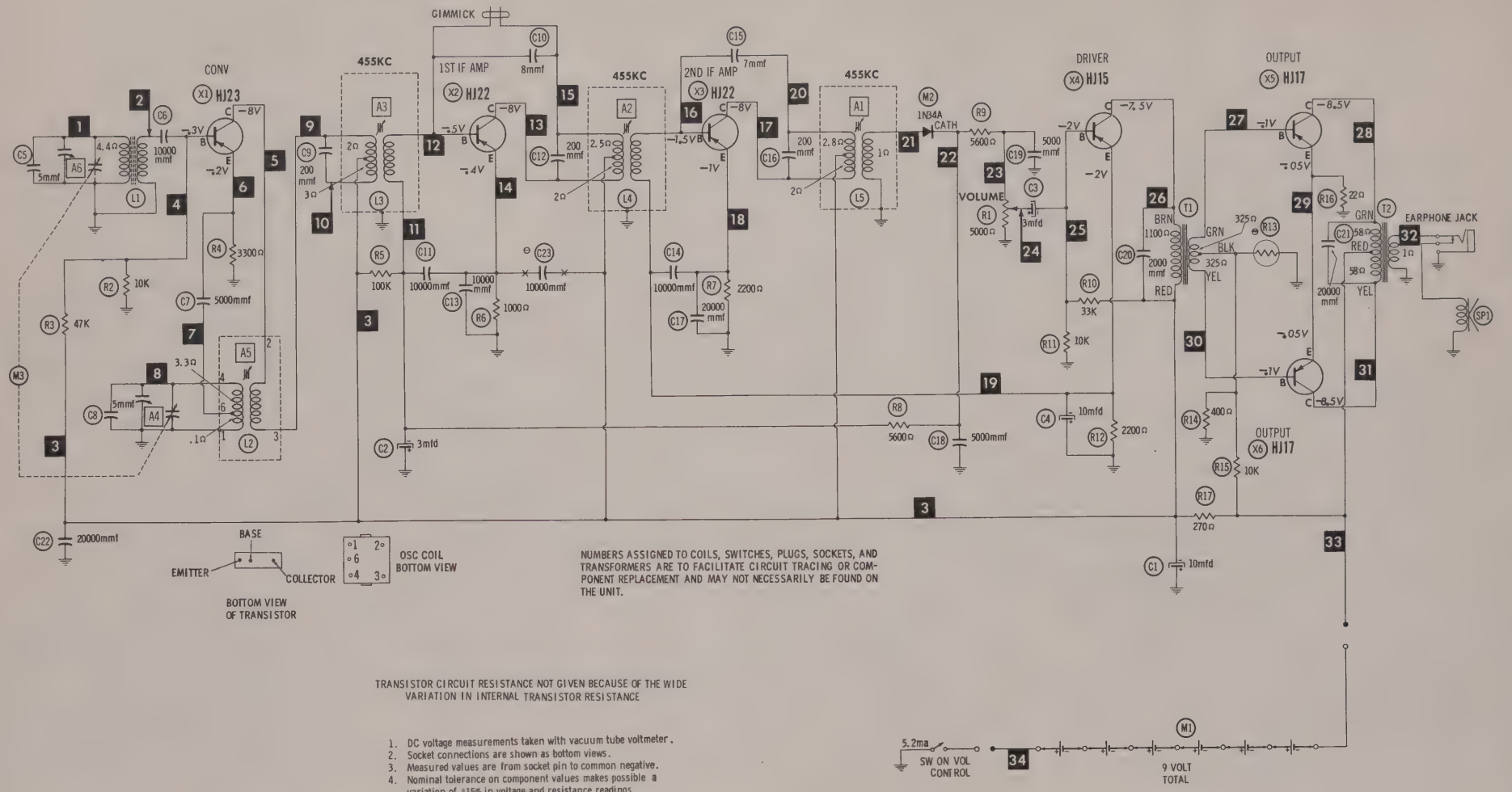
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1600KC	1600KC	"	A4	Adjust for maximum output.
3.		"	600KC	600KC	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.		"	1400KC	1400KC	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

J88

SET 446 FOLDER 11



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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HITACHI
MODEL TH-666

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	HJ23	Converter		2N412			PNP
X2	HJ22	1st IF Amplifier		2N410			PNP
X3	HJ22	2nd IF Amplifier		2N410			PNP
X4	HJ15	Driver		2N406			PNP
X5	HJ17	Output		2N408			PNP
X6	HJ17	Output		2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	HITACHI PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10		PWE10010	EC10-10	TT12X10	ML10-15	TE-1114	
C2	3	6		XPP-6003	NLW3-6	TT6X3		TE-1082	
C3	3	6		XPP-6003	NLW3-6	TT6X3		TE-1082	
C4	10	6		PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	HITACHI PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	5			S-26	NPO-DI5	TCZ-4R7	L10V5	CNO-547	5GA-V5	
C6	10000			ULD-12	BPD-01	DD-103	BYA10S1	TA-110	3GAB-S1	
C7	5000				BPD-005	DD-502	BYA10D5	TA-250	5GA-D5	
C8	5			S-26	NPO-DI5	TCZ-4R7	L10V5	CNO-547	5GA-V5	
C9	200			S-32	SI 200	D6-201	L10T2	UC-532	5GA-T2	
C10	8				NPO-DI8. 2		L10V8		5GA-V8	
C11	10000			ULD-12	BPD-01	DD-103	BYA10S1	TA-110	3GAB-S1	
C12	200			S-32	SI 200	D6-201	L10T2	UC-532	5GA-T2	
C13	10000			ULD-12	BPD-01	DD-103	BYA10S1	TA-110	3GAB-S1	
C14	10000			ULD-12	BPD-01	DD-103	BYA10S1	TA-110	3GAB-S1	
C15	7			S-26	NPO-DI6. 8	TCZ-6R8	L10V7	CNO-568	5GA-V75	
C16	200			S-32	SI 200	D6-201	L10T2	UC-532	5GA-T2	
C17	20000			ULD-15	BPD-02	DA-203	BYB6S2	TA-120	5GA-S2	
C18	5000				BPD-005	DD-502	BYA10D5	TA-250	5GA-D5	
C19	5000				BPD-005	DD-502	BYA10D5	TA-250	5GA-D5	
C20	2000			KD-10	BPD-002	DD-202	BBA10D2	B-220	5GA-D2	
C21	20000			ULD-15	BPD-02	DA-203	BYB6S2	TA-120	5GA-S2	
C22	20000			ULD-15	BPD-02	DA-203	BYB6S2	TA-120	5GA-S2	
C23	10000			ULD-12	BPD-01	DD-103	BYA10S1	TA-110	3GAB-S1	①

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HITACHI PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10	33.07T					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		HITACHI PART No.	NOTES
	OHMS	WATT		
R2	10K			
R3	47K			
R4	3300Ω			
R5	100K			
R6	1000Ω			
R7	2200Ω			
R8	5600Ω			
R9	5600Ω			

ITEM No.	RATING		HITACHI PART No.	NOTES
	OHMS	WATT		
R10	33K			
R11	10K			
R12	2200Ω			
R13			B-2B	Note 1.
R14	400Ω			
R15	10K			
R16	22Ω			
R17	270Ω			

Note 1. Temperature compensating unit

PRINTED BOARD

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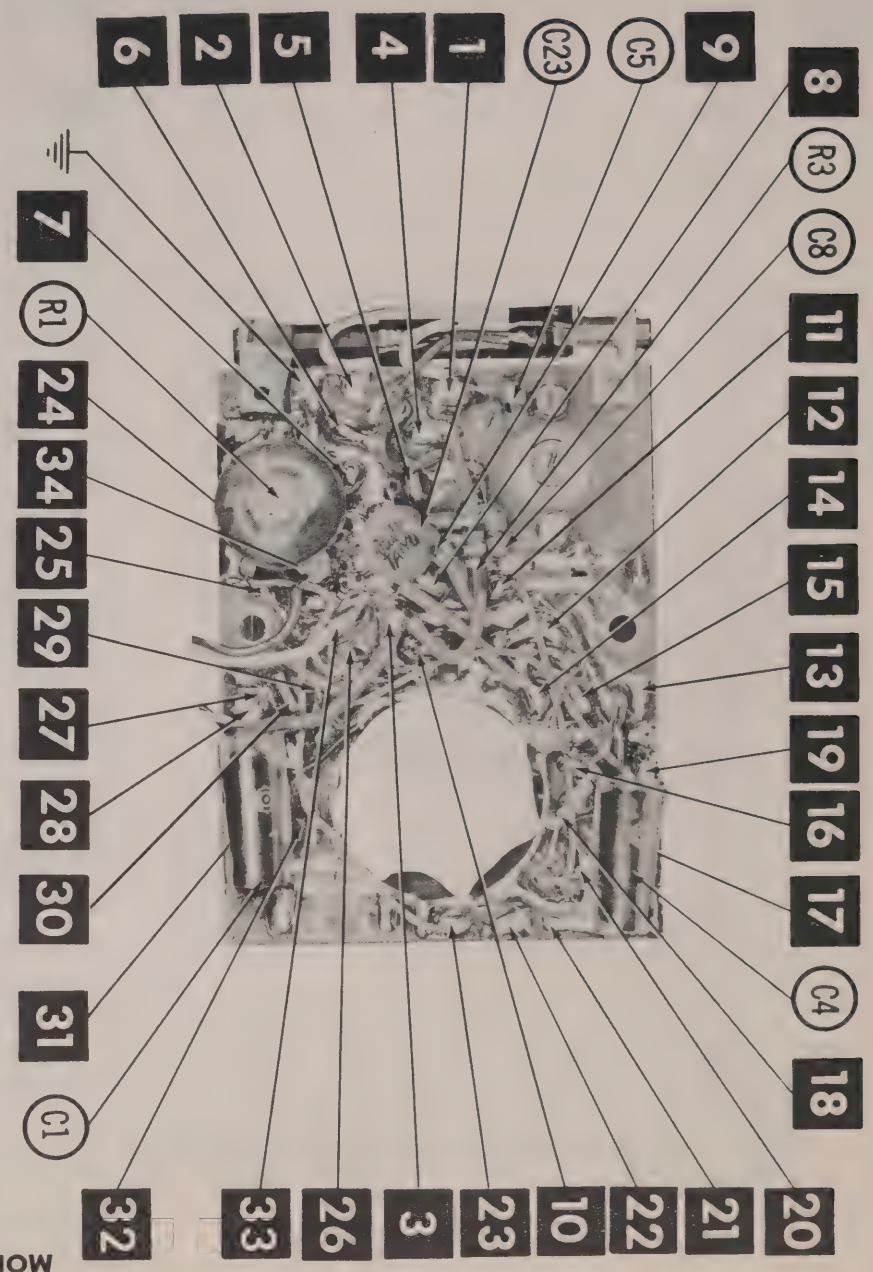


HITACHI
MODEL TH-666

FOLDER 11

PARTS LIST AND DESCRIPTIONS (Con't)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		HITACHI PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	HITACHI PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	CT-65						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HITACHI PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2500Ω CT	12-14Ω	0T-66							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HITACHI PART No.	QUAM PART No.	
SP1	2"	PM	12-14Ω			

BATTERIES

ITEM No.	VOLTAGE	HITACHI PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		TR-146R	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		HITACHI PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N34A		1N34A	1N38A	Detector (Pigtail)

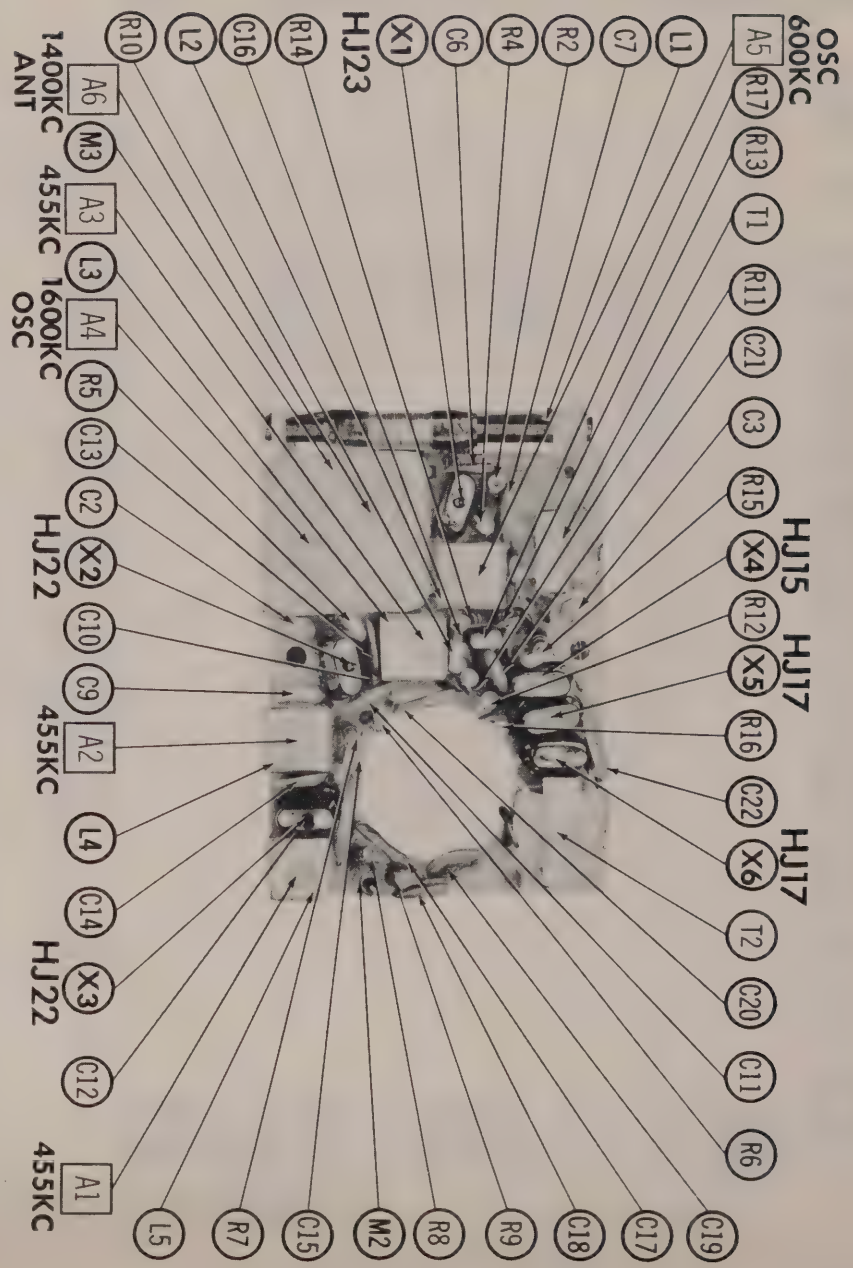
MISCELLANEOUS

ITEM No.	PART NAME	HITACHI PART No.	NOTES
M3	Tuning Cap Earphone	EL-212	2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder

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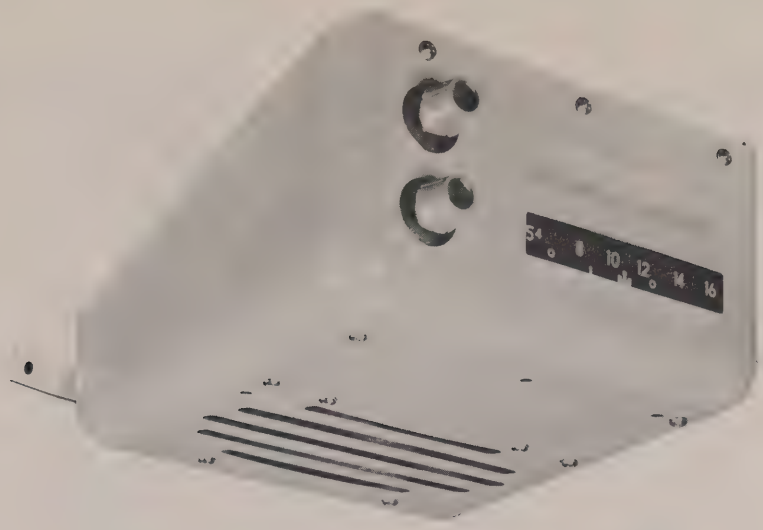
INTERNATIONAL MODEL 94MIM

INTERNATIONAL
MODEL 94MIM



TRADE NAME	International Model 94M1M (For 1959 International "A" Line Trucks)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage BAttery
RATING	2 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A6, A7..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8, A9, A10..... GENERAL CEMENT #9050L, 9150
WALSCO #2521

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna receptacle. Low side to chassis.	262.5KC (400% Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy antenna to antenna receptacle	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless the tuning coils have been replaced or tampered with. Back the tuning cores out of the coils as far as possible. Repeat step 2.						
3.	Fig. 1	Thru dummy antenna to antenna receptacle	1020KC	Carriage 9/16" in from high end stop.	Across voice coil	A8, A9, A10	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement is noted. Make step 2 the last step. Cement cores.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

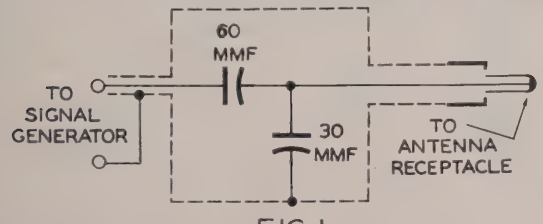


FIG. 1

DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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J173

SET 446 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	
V3	IF Amplifier	12BL6	
V4	Det. - AVC - Driver	12DL8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N176	Output	2N155	2N176		2N176	PNP Note 1

Note 1. When replacing, coat both sides of insulator with DC-4 grease (Part #1lM490487) or equivalent. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	16	23B539261	AFH2-02-10	B0045	WP200.5	TMD-109	TVL-2175	
B	▲100	16							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	50-280			20A77536						
C3	560			21R120936	BPD-00056	DD-561	L10T56	B-356	5GA-T56	
C4	100		N750 10%	21R410036	N750-DI 100	DTN-100	L10T1U	CN7-310	5TCU-T1S 10%	
C5	.05	200		8R121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C6A	50-260									
B	220			20K562250						
C	47									
D	420-490									
C7	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	100		N750 10%	21R410036	N750-DI 100	DTN-100	L10T1U	CN7-310	5TCU-T1S 10%	
C9	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	18B562220		A47-1meg-Z	Q13-137	U53	Volume
B	Shaft				RS-3/16	NQ	DS-37	
C	Switch				SWE-13	76-1	US-26	Off-On
R2	210Ω	1(WW)	18K540718		39-200			Bias

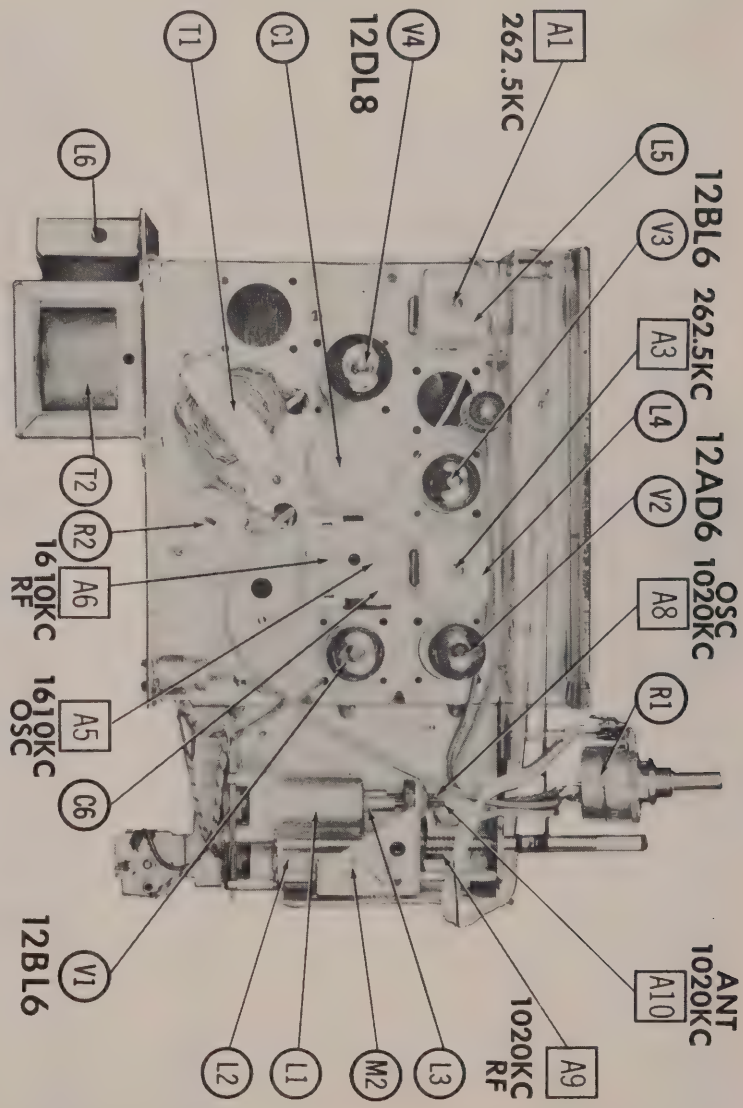
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R3	15meg		6R476065	
R4	1meg		6K124494	
R5	2.7meg		6R488136	
R6	22meg			Note 1
R7	47K		6K121299	
R8	10meg		6K125911	
R9	10meg		6K125911	
R10	47K		6K121687	
R11	1meg		6K124494	
R12	6.8meg		6K121933	
R13	5.6Ω		17K739323	
R14	.47Ω		17K488266	
R15	10Ω Cold		6K540634	
R16	470Ω			Note 2

Note 1. Some versions may use 15meg in this application (Part #6R476065).
Note 2. Some versions may use 330Ω in this application (Part #6K127940).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (cont)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Tuning Coil	24B537932 †						
L2	RF Tuning Coil	24B537932 †						
L3	Osc. Tuning Coil	24B537931 †						
L4	Input IF	24K560418	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	Output IF	24K562320	16-6754	16-6754	BC-354	12-H6		

† Part of M2

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	2A	.25Ω	.004 Hy.	25K560034						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	9.5	1	25C542378						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	22Ω Tap ⓐ 3-4Ω	25K542338							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5" x 7"	PM	3-4Ω	50C562249 ①	57A21	① Replacement Part #50C542399

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V	65R122346	9C542395	30707.5 (7AG 7½A 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

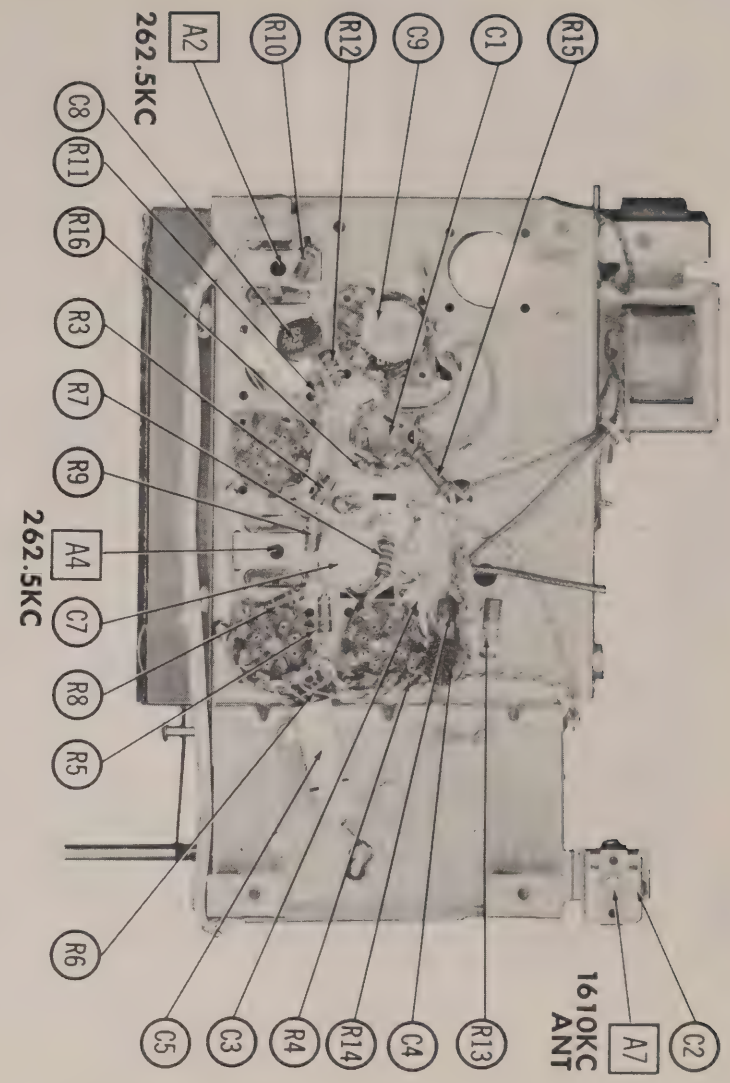
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77D562234	MT-272, Complete
M3	Spark Plate	48K539953	Selenium, Use #43A539954 Bushing, #4A542137 Washer, #5K124848 Eyelet for Mounting

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

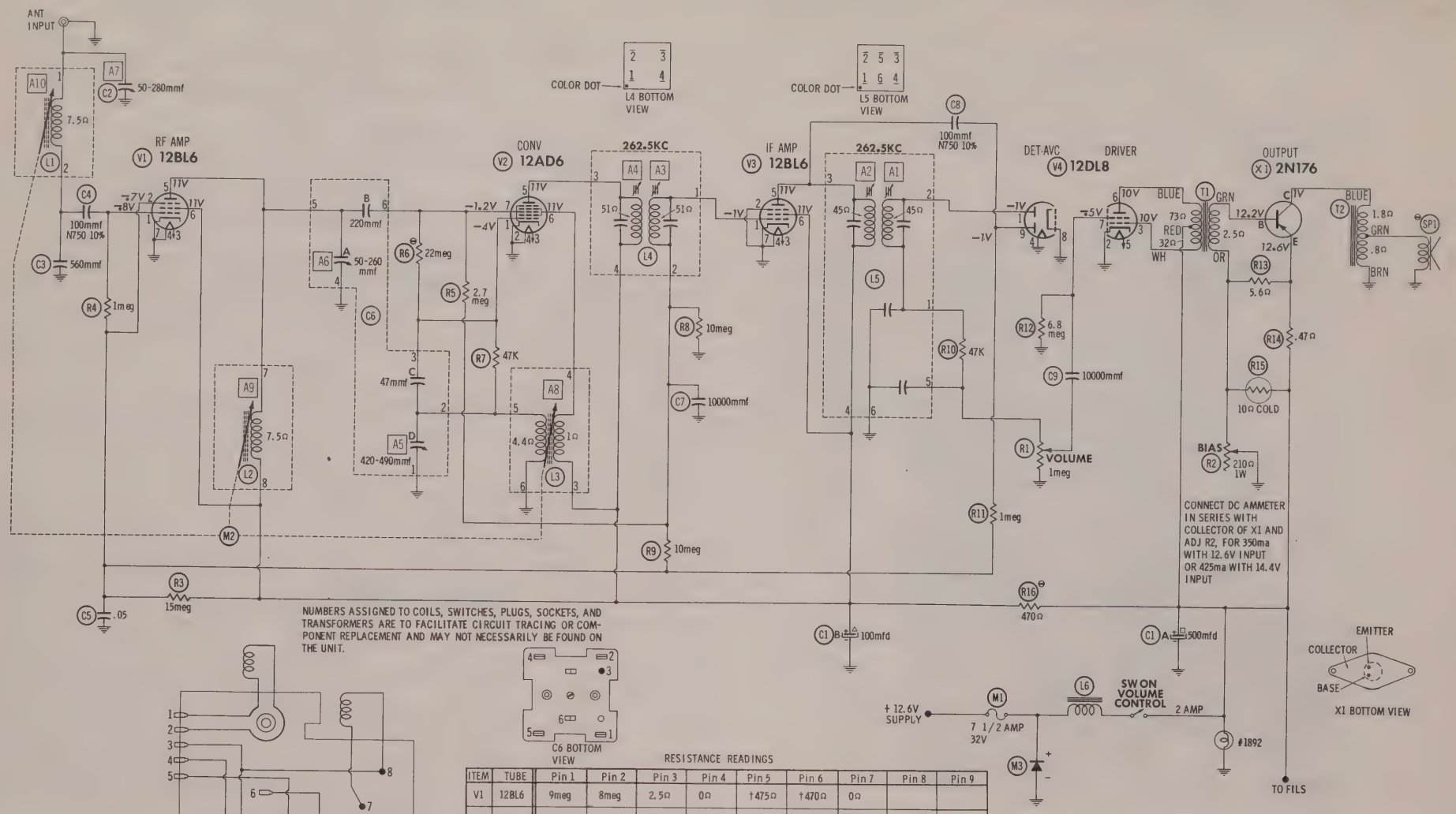
NAME	PART NO.	DESCRIPTION
Knob	36K542332	Tuning, Volume-On-Off
Pointer	52A542227	
Dial Scale	34B542223	

CHASSIS—BOTTOM VIEW



WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	9meg	8meg	2.5Ω	0Ω	†475Ω	†470Ω	0Ω		
V2	12AD6	47K	0Ω	2.5Ω	0Ω	†520Ω	†470Ω	7meg		
V3	12BL6	5.5meg	0Ω	2.5Ω	0Ω	†515Ω	†470Ω	0Ω		
V4	12DL8	1meg	0Ω	†32Ω	0Ω	2.5Ω	†73Ω	6.8meg	0Ω	10meg

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

† MEASURED FROM JUNCTION OF C1A AND R16.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

INTERNATIONAL MODEL 94MIM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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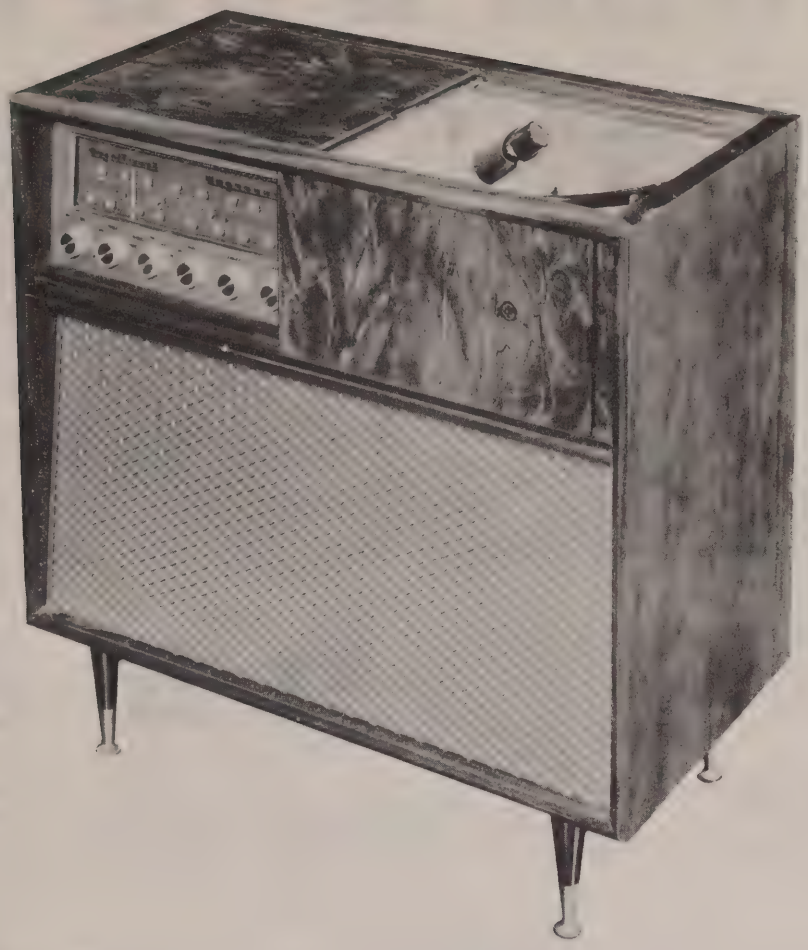
PHOTOFACT* Folder with CIRCUITRACE*

MAGNAVOX CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11

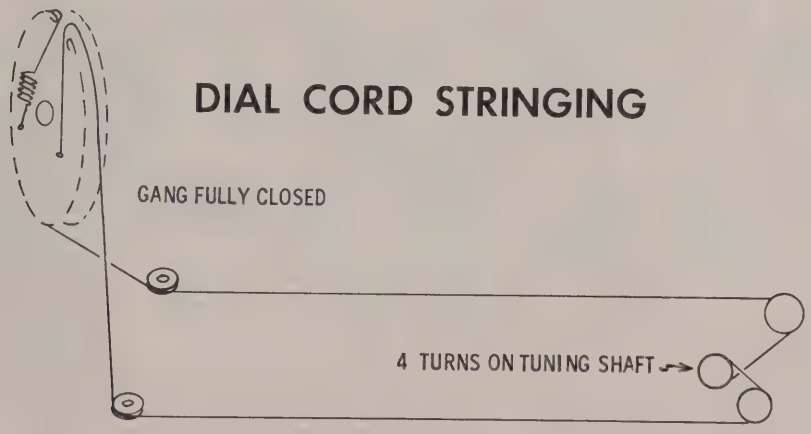
MAGNAVOX CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11



MAGNAVOX CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11

TRADE NAME	Magnavox CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Externally Powered 8 Tube FM-AM Tuner with Stereo Phono Amplifier

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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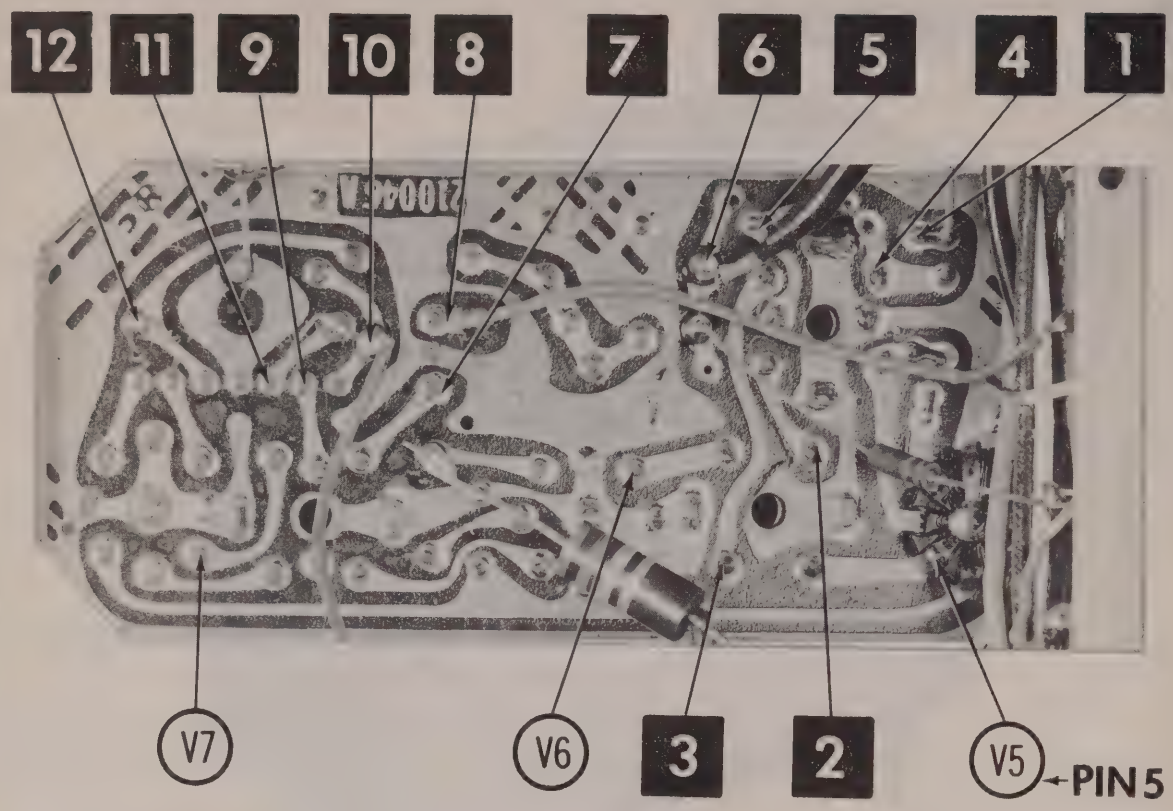
J236

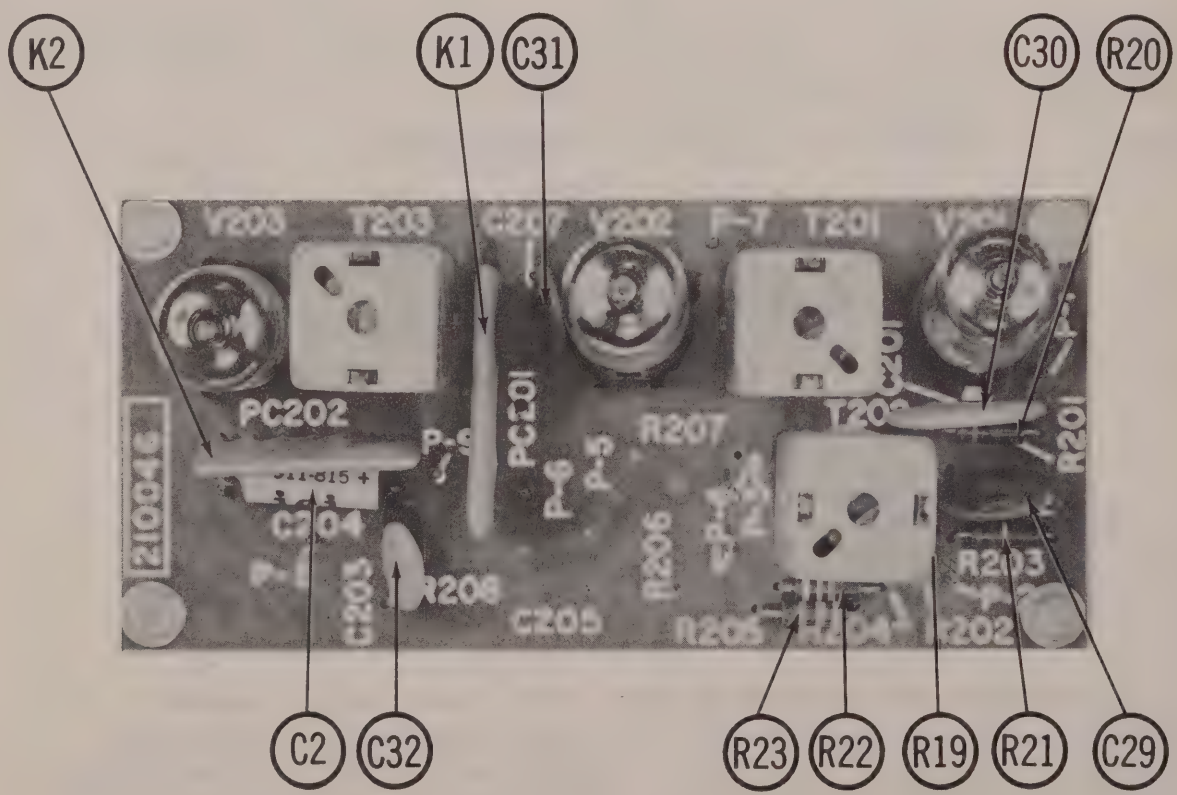
SET 446 FOLDER 13



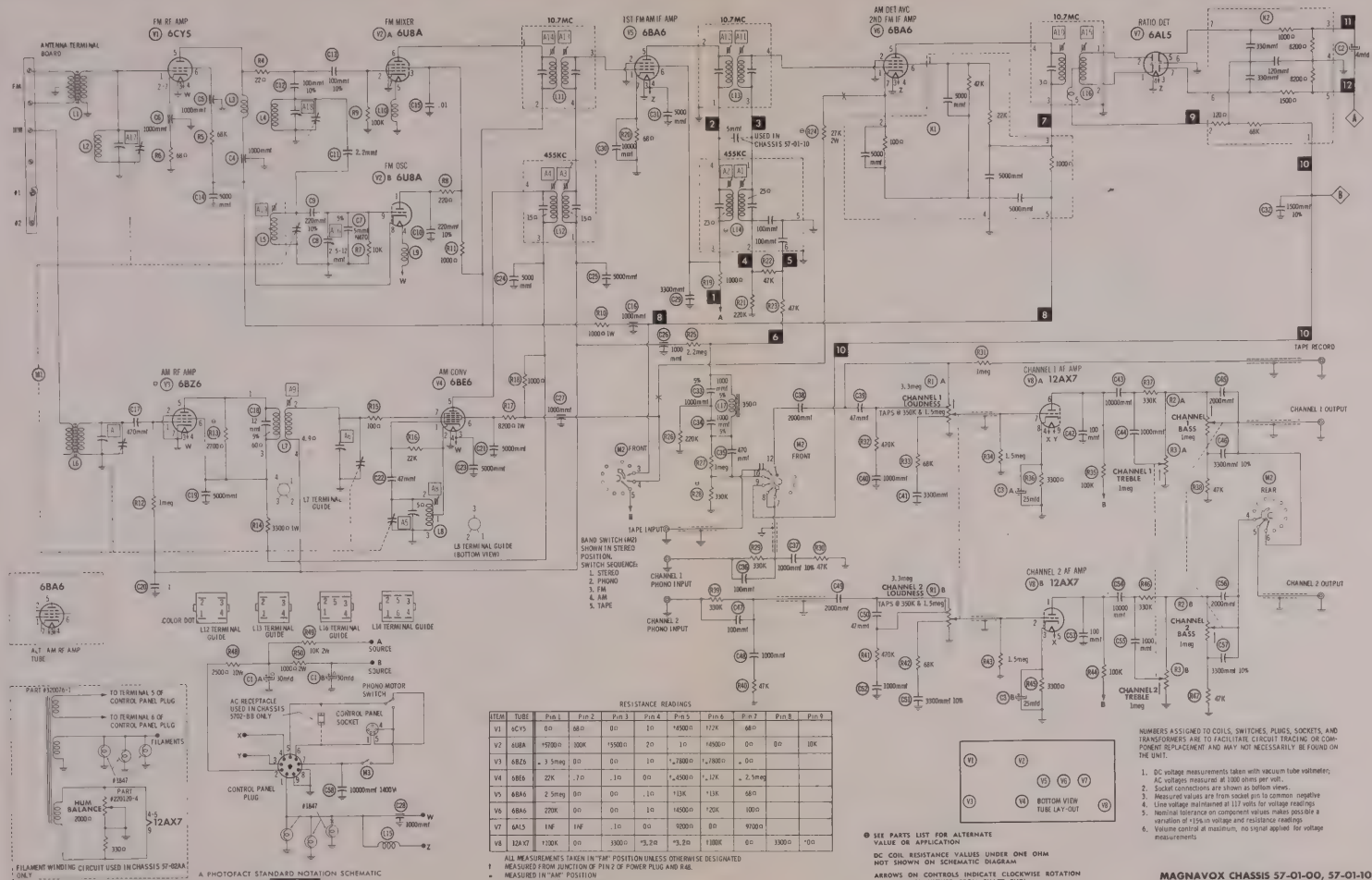
A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PRINTED BOARD



PRINTED BOARD — TOP VIEW


FM RF AMP V1 6CY5
FM MIXER V2 A 6U8A
FM OSC V2 B 6U8A
1ST FM AM IF AMP V5 6BA6
AM DET AVC 2ND FM IF AMP V5 6BA6
RATIO DET V7 6AL5
AM RF AMP V1 6BZ6
AM CONV V4 6BE6
CHANNEL 1 AF AMP V8 A 12AX7
CHANNEL 2 AF AMP V8 B 12AX7
10.7MC
455KC
ANTENNA TERMINAL BOARD
TAPE RECORD
CHANNEL 1 OUTPUT
CHANNEL 2 OUTPUT
TAPE INPUT
CHANNEL 1 PHONO INPUT
CHANNEL 2 PHONO INPUT
BAND SWITCH (4M2) SHOWN IN STEREO POSITION. SWITCH SEQUENCE: 1. STEREO 2. PHONO 3. FM 4. AM 5. TAPE
USED IN CHASSIS 57-01-10
L7 TERMINAL GUIDE
L8 TERMINAL GUIDE (BOTTOM VIEW)
L12 TERMINAL GUIDE
L13 TERMINAL GUIDE
L14 TERMINAL GUIDE
COLOR DOT
A SOURCE
B SOURCE
PHONO MOTOR SWITCH
AC RECEPTACLE USED IN CHASSIS 57-02-BB ONLY
CONTROL PANEL SOCKET
CONTROL PANEL PLUG
A.F. AM RF AMP TUBE
FILAMENTS
HUM BALANCE
FILAMENT WINDING CIRCUIT USED IN CHASSIS 57-02AA ONLY
A PHOTOFACT STANDARD NOTATION SCHEMATIC
CIRCUITRACE
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RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	0Ω	68Ω	0Ω	1Ω	†450Ω	†72K	68Ω		
V2	6U8A	†570Ω	100K	†550Ω	2Ω	1Ω	†650Ω	0Ω	0Ω	10K
V3	6BZ6	.3.5meg	0Ω	0Ω	1Ω	*.78Ω	*.780Ω	.0Ω		
V4	6BE6	22K	.7Ω	.1Ω	0Ω	*.45Ω	*.12K	.2.5meg		
V5	6BA6	2.5meg	0Ω	0Ω	.1Ω	*13K	*13K	68Ω		
V6	6BA6	270K	0Ω	0Ω	1Ω	†450Ω	†20K	100Ω		
V7	6AL5	1MF	1MF	.1Ω	0Ω	920Ω	0Ω	970Ω		
V8	12AX7	†100K	0Ω	330Ω	*3.2Ω	*3.2Ω	†100K	0Ω	330Ω	†0Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM JUNCTION OF PIN 2 OF POWER PLUG AND R48.
- MEASURED IN "AM" POSITION
* MEASURED FROM PIN 3 OF POWER PLUG

V1 V2 V3 V4 V5 V6 V7 V8 BOTTOM VIEW TUBE LAY-OUT

◎ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

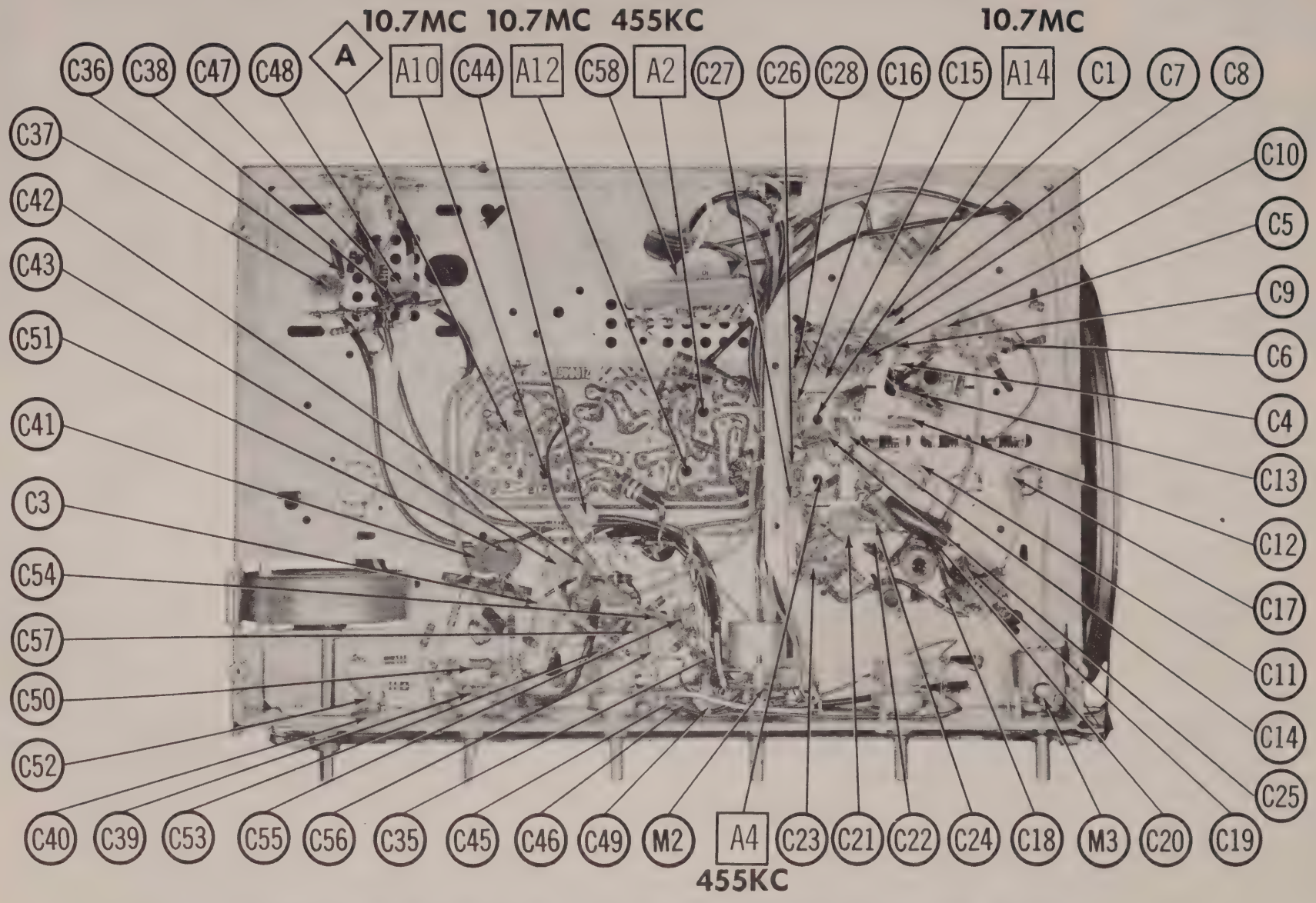
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

MAGNAVOX CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11



CHASSIS BOTTOM VIEW – CAPACITOR, MISC. & ALIGN. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
- A1 thru A4, A10 thru A15 . . . GENERAL CEMENT #5097, 8727; WALSCO #2515
- A5 thru A7, A17, A18 . . . . . GENERAL CEMENT #5004, 5008, 5009; WALSCO #2520
- A8, A9, A16 . . . . . GENERAL CEMENT #8721, 8722; WALSCO #2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	10mmf	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to pin 1 (grid) of FM RF Amp. Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully closed	DC probe to point Ⓐ. Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 4 and 5.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01mfd	High side to pin 7 (grid) of FM RF Amp. Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully closed	Vert. Amp. to point Ⓐ. Low side to chassis.	A10, A11, A12, A13, A14	Disconnect stabilizing capacitor (C2). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A15	Reconnect stabilizing capacitor (C2). Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	107MC (Unmod)	FM	107MC	DC probe to point Ⓐ. Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
7.	"	"	89MC	"	89MC	"	A19	Adjust for maximum deflection. Repeat steps 6 and 7.

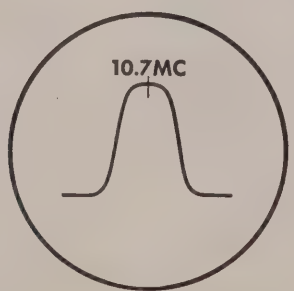


FIG. 1

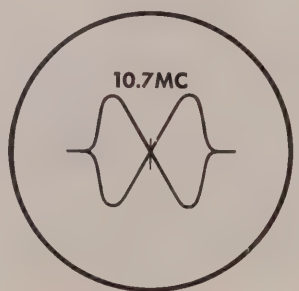
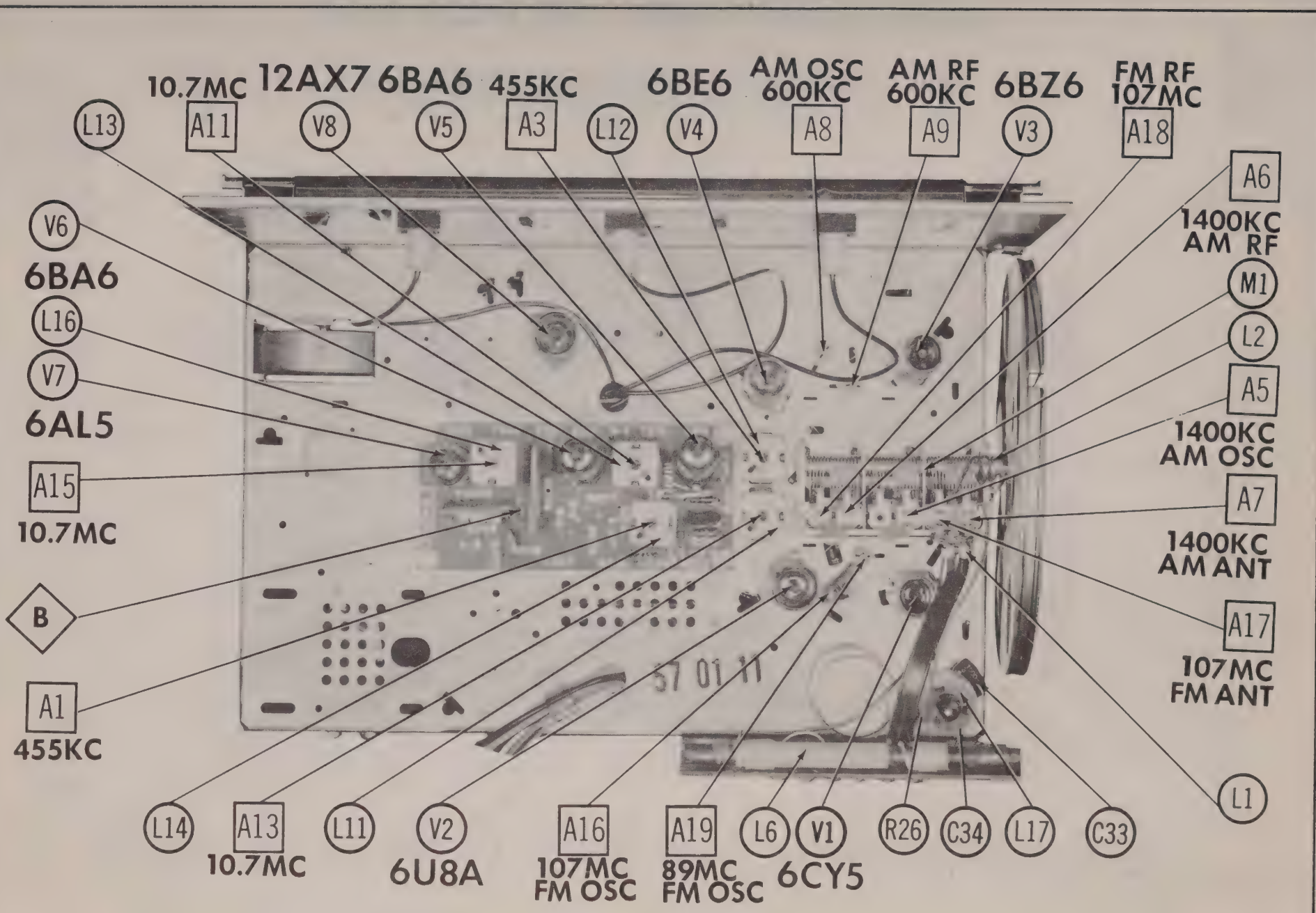


FIG. 2



CHASSIS — TOP VIEW

PARTS LIST AND DESCRIPTIONS (cont)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MAGNAVOX PART No.	NOTES
R4	22Ω		230104-42	
R5	68K		230104-84	
R6	68Ω		230104-48	
R7	10K		230104-74	
R8	220Ω		230104-54	
R9	100K		230104-86	
R10	1000Ω	1	230105-62	
R11	1000Ω		230104-62	
R12	1meg		230104-98	
R13	2700Ω		230104-67	Note 1
R14	3300Ω	1	230105-68	
R15	100Ω		230104-50	
R16	22K		230104-78	
R17	8200Ω	1	230105-73	
R18	1000Ω		230104-62	
R19	1000Ω		230104-62	
R20	68Ω		230104-48	
R21	220K		230104-90	
R22	47K		230104-82	
R23	47K		230104-82	
R24	27K	2	230106-79	Note 2
R25	2.2meg		230104-102	
R26	220K		230104-90	
R27	1meg		230104-98	

Note 1. Ch. 57-01-10 use 820Ω in this application.
Note 2. Not used in Ch. 57-01-10.

ITEM No.	RATING OHMS	RATING WATT	MAGNAVOX PART No.	NOTES
R28	330K		230104-92	Note 3
R29	330K		230104-92	
R30	47K		230104-82	
R31	1meg		230104-98	
R32	470K		230104-94	
R33	68K		230104-84	
R34	1.5meg		230104-100	
R35	100K		230104-86	
R36	3300Ω		230104-68	
R37	330K		230104-92	
R38	47K		230104-82	
R39	330K		230104-92	
R40	47K		230104-82	
R41	470K		230104-82	
R42	68K		230104-84	
R43	1.5meg		230104-110	
R44	100K		230104-86	
R45	3300Ω		230104-67	
R46	330K		230104-92	
R47	47K		230104-82	
R48	2500Ω	10	240076-26	
R49	10K	2	230106-1074	
R50	1000Ω	2	230106-1062	

Note 3. Ch. 57-01-10 use 150K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MAGNAVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	360491-4						
L2	FM Ant. Coil	360750-1						
L3	RF Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L4	FM RF Coil	360751-1						
L5	FM Osc. Coil	360628-1						
L6	Loopstick	360746-1						
L7	AM RF Trans.	360753-1						
L8	AM Osc. Coil	360752-1	14-1055	14-1055	BC-393	70-OSC *		Tapped @ .5Ω
L9	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L10	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L11	1st FM IF Trans.	360626-1	16-3487	16-3487	FM-254	1463		

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA MAGNAVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L12	1st AM IF Trans.	360611-1	16-6758	16-6758	BC-352	12-C1	RF-1	
L13	2nd FM IF Trans.	360747-1	16-3490	16-3490		1463-PC		
L14	2nd AM IF Trans.	360781-1	16-6781	16-6781		13-PC6		Note 1
L15	Fil. Choke	360522-9	19-1002	19-1002	BC-563	4606		2uh
L16	Ratio Detector	360748-1				1465-PC		
L17	10KC Filter	360621-1						490MH

Note 1. Later production of Ch. 57-01-10 use Part #360781-2. * Disregard primary winding.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	FM IF Decoupling	5000mmf, 5000mmf, 5000mmf, 5000mmf, 100Ω, 1000Ω, 22K, 47K,	250255-1	
K2	Ratio Detector	120mmf, 330mmf, 330mmf, 120Ω, 1500Ω, 8200Ω, 8200Ω, 68K	250254-1	Sprague C-9

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M1	Tuning Cap.	260147-1	6 Section AM (Ant. 28-322mmf, RF. 15-280mmf, Osc. 22-151mmf)
M2	Switch	160293-1	Band switch
M3	Switch	160301-1	Off-On
	Printed Board	210046	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.	6CY5	
V2	FM Mixer-FM Osc.	6U8A	
V3	AM RF Amp.	6BZ6	6BA6 *
V4	AM Conv.	6BE6	
V5	1st FM-AM IF Amp.	6BA6	
V6	2nd FM IF Amp. - AM Det. -AVC	6BA6	
V7	Ratio Det.	6AL5	
V8	Channel #1 AF Amp. - Channel #2 AF Amp.	12AX7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	450	270021-58	AFH2-54	B0430	FP237	TMD-52	TVL-2759	
B	▲30	450							
C2	4	50	270021-71	PWE50005	EC5-50	TT50X4	ML4-50	TE-1302.1	
C3A	25	25	270043-1	PRS25V25	BBR25-25	TCD26	TD-25-25	TVA-1205	
B	25	25		PRS25V25	BBR25-25		TD-25-25	TVA-1205	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	1000			250276-2	EF-001	MFT-1000			503C-D1	
C5	1000			250276-2	EF-001	MFT-1000			503C-D1	
C6	1000			250276-2	EF-001	MFT-1000			503C-D1	
C7	5		N470 5%	250088-138						
C8	2.5-12			250188-9		829-10				
C9	220		10%	250187-57	1469-00022	D6-221	22R5T22		MS-322	
C10	220		10%	250187-57	1469-00022	D6-221	22R5T22		MS-322	
C11	2.2			250211-118	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22	
C12	100		10%	250187-53	1469-0001	DD-101	22R5T1	MCB235	MS-310	
C13	100		10%	250187-53	1469-0001	DD-101	22R5T1	MCB235	MS-310	
C14	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C15	.01	100		250211-7	P288N-01	DD-103	CUB2S1	GEM-211	2TM-S1	
C16	1000			250276-1	EF-001	MFT-1000			503C-D1	
C17	470			250159-102	1469-00047	DD-471	22R5T47		MS-347	
C18	12		5%	250088-179	1469-000012		22R5Q12		MS-412	
C19	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C20	.1	100		250261-125	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C21	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C22	47			250218-17	BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C23	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C24	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C25	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C26	1000			250276-1	EF-001	MFT-1000			503C-D1	
C27	1000			250276-1	EF-001	MFT-1000			503C-D1	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C28	1000			250276-1	EF-001	MFT-1000			503C-D1	
C29	3300			250234-154	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	
C30	10000			250234-66	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	5000			250236-1	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C32	1500		10%	250234-146	DI-1500			JL-215	5GA-D15S 10% *	
C33	1000		5%	250228-354	1469-001		1R5D1	MCE255	MS-210	
C34	1000		5%	250228-354	1469-001		1R5D1	MCE255	MS-210	
C35	470			250218-6	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C36	100			250218-22	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C37	1000		10%	250218-8	DI-1000			JL-210	5GA-D1S 10% *	
C38	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C39	47			250218-17	SI 47	D6-470	L10Q47	UC-5447	5GA-Q47	
C40	1000			250218-8	BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C41	3300			250175-28	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	
C42	100			250218-22	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C43	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C44	1000			250218-8	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C45	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C46	3300		10%	250175-28	DI-3300			JL-233	5GA-D33S 10%*	
C47	100			250218-22	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C48	1000			250218-8	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C49	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C50	47			250218-17	SI-47	D6-470	L10Q47	UC-5447	5GA-Q47	
C51	3300		10%	250175-28	DI-3300			JL-233	5GA-D33S 10% *	
C52	1000			250175-28	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C53	100			250218-22	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C54	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C55	1000			250218-8	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C56	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C57	3300		10%	250218-28	DI-3300			JL-233	5GA-D33S 10% *	
C58	10000	1400		250219-2	DAC-27	DD-103	HVE16S1	2HV-110	20HKB-S1	

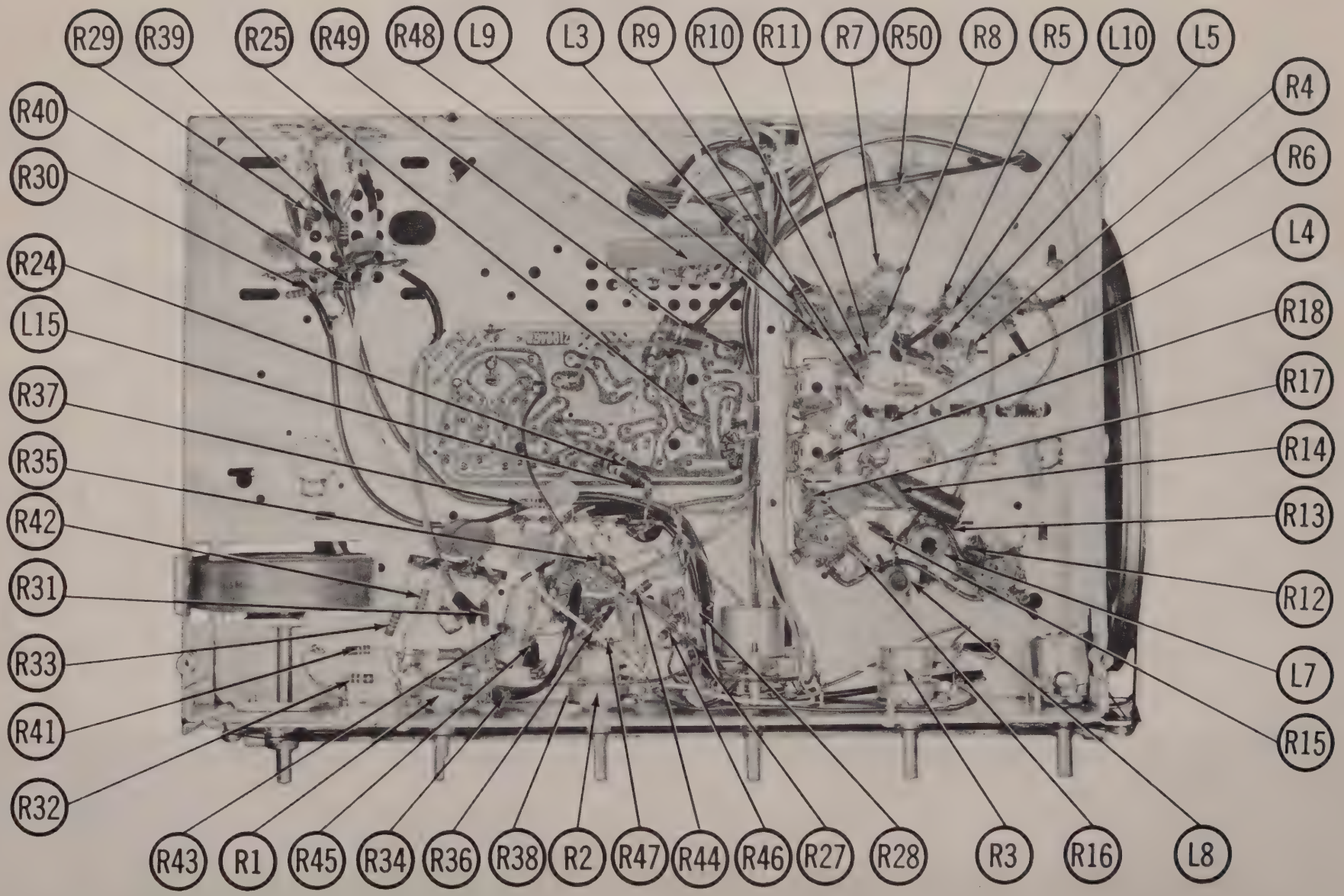
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.3meg		220151-10	BT-180				Loudness, Channel 1, Note 1
B	3.3meg			STR-180				Loudness, Channel 2, Note 1
R2A	1meg		220151-11	B-70	AD47-1meg-Z	Q13-137		Bass, Channel 1
B	1meg			SR-70	Not Req.	M13-137	†	Bass, Channel 2
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	1meg		220151-11	B-70	AD47-1meg-Z	Q13-137		Treble, Channel 1
B	1meg			SR-70	Not Req.	M13-137	†	Treble, Channel 2
C	Shaft			Not Req.	FS-3	Not Req.		

† "STA-LOC" Equivalent: FA16A, RU16A, CS3500.

Note 1. Tapped @ 350K & 1.5meg.



CHASSIS BOTTOM VIEW — RESISTOR & INDUCTOR IDENT.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

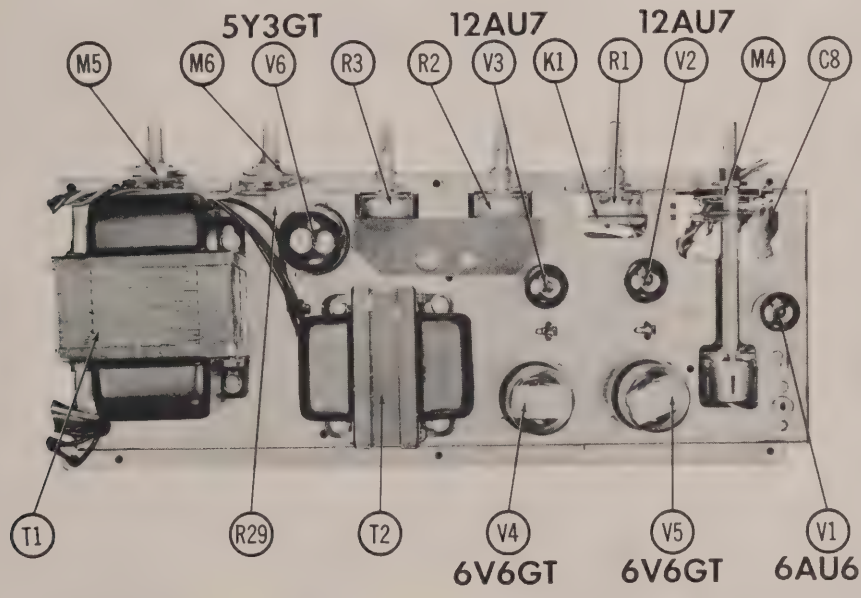
MOTOROLA MODELS 6K13B, CW, M, W (Ch. HS-675)

MOTOROLA MODELS 6K13B, CW, M, W (Ch. HS-675)

MODEL 6K13M

TRADE NAME	Motorola Models 6K13B, 6K13CW, 6K13M, 6K13W (Ch. HS-675)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 6 Channel Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 73 Watts, .66 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON VM17RC RECORD CHANGER — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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J147

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st AF Amplifier	6AU6	
V2	2nd - 3rd AF Amp.	12AU7	
V3	4th AF Amp-Phase Inv.	12AU7	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Motorola PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	400	23B632244	AFH4-79-10	D0663	FP447	TMT-39	TVL-4737	
B	■40	400					TD-50-25		
C	▲20	400							
D	40	25							
C2	5	10NP	23A632250	NP-PRS350V5	BBR10-25 † BBR10-25	TCN105		TVAS-1110*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Connect Negative Leads Together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Motorola PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	400		8R121002	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C4	.001	600		8R122103	P688N-001	DD-102	CUB6D1	GEM-621	6TM-D1	
C5	100		N750	21R400537	N750-D1 100	TCN-100	C10T1U	CN7-310	5TCU-T1	
C6	.25	600		8R122264	P688N-25		CUB6P25	GEM-6025	6TM-P25	
C7	.001	400		8R121003	P488N-001	DD-102	CUB4D1	GEM-421	4TM-D1	
C8	100		N750	21R400537	N750-D1 100	TCN-100	C10T1U	CN7-310	5TCU-T1	
C9	470		10%	21K121797	D1-470	D6-471		JL-470	5GA-T47S 10%*	
C10	.01	400		8R121002	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C11	1000			21A121678	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	10000			21R121946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C13	.02	400		8R121566	P488N-02	DF-203	CUB4S2	GEM-412	4TM-S2	
C14	.05	400		8R121567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C15	.05	400		8R121567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Motorola PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	18K642165①	C1-70		Q18-137XX	UDT-289	Loudness, Taps ⓐ 400K & 700K
R2A	2meg	½	18K642164	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	18K642164	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

① Includes K-1 (PC25420)

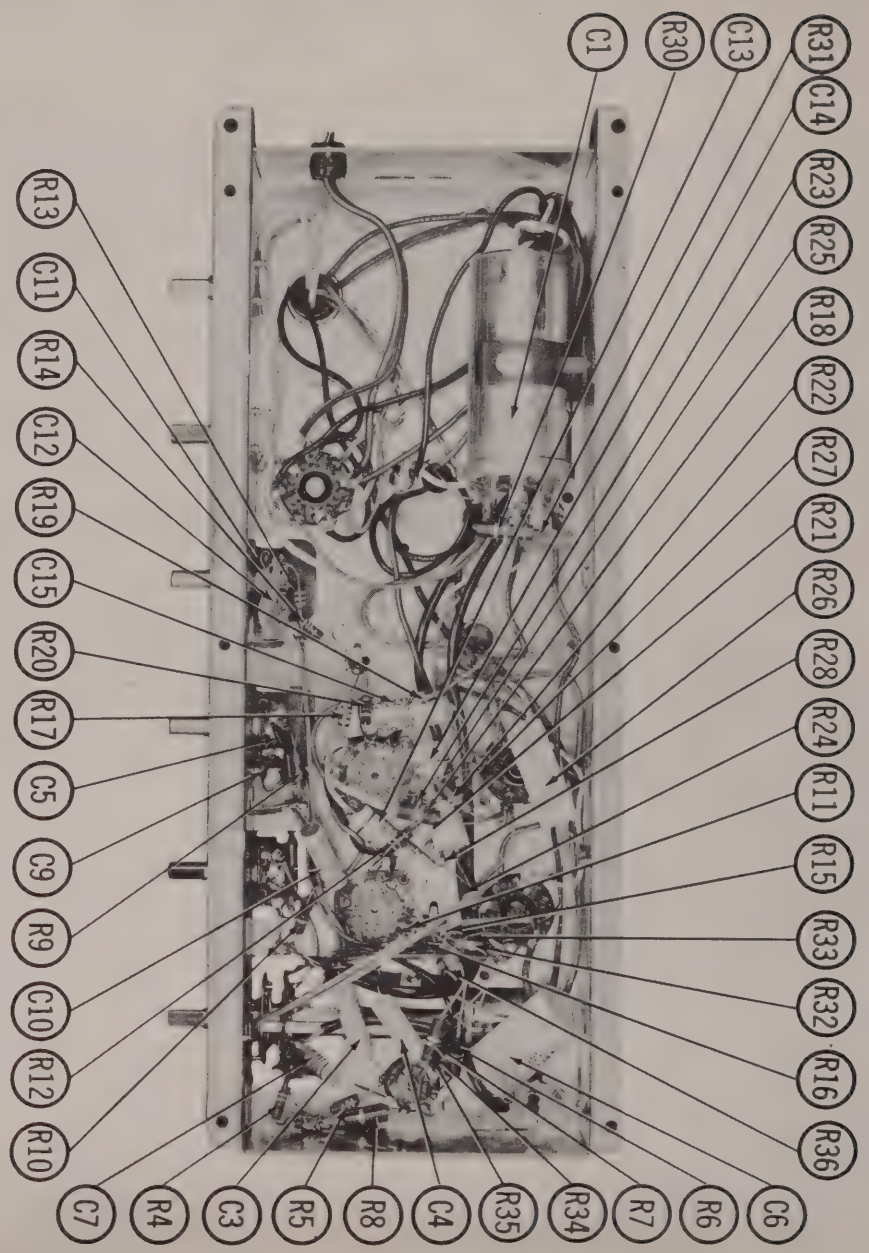
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Motorola PART No.	NOTES
	OHMS	WATT		
R4	3.3meg		6K119407	
R5	3.3meg		6K119407	
R6	100K	1	6R6328	

ITEM No.	RATING		Motorola PART No.	NOTES
	OHMS	WATT		
R7	100K	1	6R6328	
R8	2200Ω	1	6K125404	
R9	2.2meg		6K127001	

CHASSIS—BOTTOM VIEW



PARTS LIST & DESCRIPTION (continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Motorola PART No.	NOTES
R10	220K		6K122322	
R11	100K		6K125534	
R12	3300Ω		6K121725	
R13	470K		6K119406	
R14	47K		6K121299	
R15	100K		6K125534	
R16	3300Ω		6K121725	
R17	470K		6K121279	
R18	100K	1	6R6328	
R19	5600Ω		6K127005	
R20	4700Ω		6K121847	
R21	220K		6K122322	
R22	100K	1	6R6328	
R23	2200Ω		6R6069	

ITEM No.	RATING OHMS	RATING WATT	Motorola PART No.	NOTES
R24	100Ω		6R6018	
R25	220K		6K122322	
R26	220Ω	5	17K632247	
R27	100Ω		6R6018	
R28	330K		6K128227	
R29	18Ω	5	17K641670	
R30	1200Ω	1	6R5770	
R31	22K	1	6R6289	
R32	820K		6K128230	
R33	150K		6R6182	
R34	27Ω		6B119401	
R35	27Ω		6B119401	
R36	3.3Ω		17K485412	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Motorola PART No.	REPLACEMENT DATA
K1	Tone Compensation	50mmf, 100mmf, 3000mmf, 3000mmf, 100K, 100K	(Part of R1)	Centralab PC325 Sprague TC-5

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Motorola PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .66A	600 VCT ⓐ .090A	5V ⓐ 2A	25C638551	22R04 ①			P-8175 ②	22R04 ①	
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ 2A									

① Use Original Shields
② Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Motorola PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7000Ω CT	6-8Ω	25C641732	22S68			A-3304	22S68	S-24A	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Motorola PART No.	QUAM PART No.	NOTES
SP1	15"	PM	6-8Ω	50C632259①	15A10L ①	① Parallel And Phase
SP2	5 1/4"	PM	14-16Ω	50K638576②	52A1Z15.5②	② Series And Phase
SP3	5 1/4"	PM	14-16Ω	50K638577②	52A1Z16②	
SP4	5"	PM	8-10Ω	50C638562①	5A15TZ8.9①	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Motorola PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1		*89-TB				* Includes needles and mounting mechanism

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Motorola PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		S61 or S61DS †♦ or S61D ♦	W-77TPS † or W-77DS ♦† or W-77TPD♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Motorola PART No.	NOTES
M3	Lamp	65R125595	#1847
M4	Switch	40C641625	Compensator (5 Position, Rotary Wafer Type)
M5	Switch	40K643290	Power On-Off (SPST, Rotary Snap Type)
M6	Switch	40B641797	Speaker Selector (3 Position, Rotary Wafer Type)
M7	Switch	40B641797	Presence (3 Position, Rotary Wafer Type)

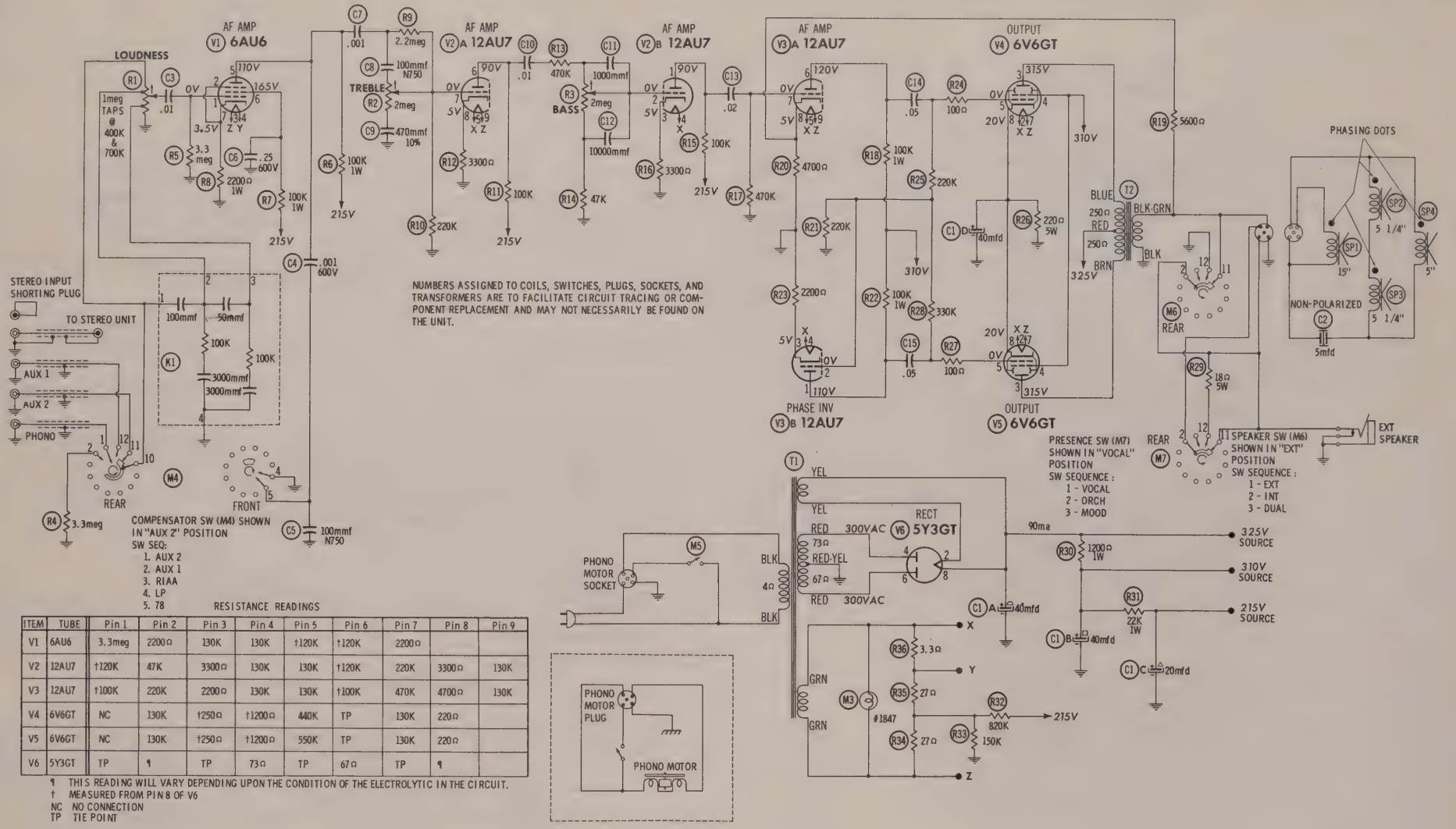
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K641617	Compensator-On-Off
Knob	36D641600	Loudness
Knob	36K641603	Bass, Treble
Knob	36K641605	Presence
Knob	36K641608	Speakers
Cabinet	16K641571	Blond, Model 6K13B
Cabinet	16E641572	Cherry, Model 6K13CW
Cabinet	16E641570	Mahogany, Model 6K13M
Cabinet	16K641573	Walnut, Model 6K13W
Lid	16K640053	Cabinet, Model 6K13B
Lid	16K642396	Cabinet, Model 6K13CW
Lid	16K640054	Cabinet, Model 6K13M
Lid	16K640056	Cabinet, Model 6K13W

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	3.3meg	2200Ω	130K	130K	†120K	†120K	2200Ω		
V2	12AU7	†120K	47K	3300Ω	130K	130K	†120K	220K	3300Ω	130K
V3	12AU7	†100K	220K	2200Ω	130K	130K	†100K	470K	4700Ω	130K
V4	6V6GT	NC	130K	†250Ω	†1200Ω	440K	TP	130K	220Ω	
V5	6V6GT	NC	130K	†250Ω	†1200Ω	550K	TP	130K	220Ω	
V6	5Y3GT	TP	¶	TP	73Ω	TP	67Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V6
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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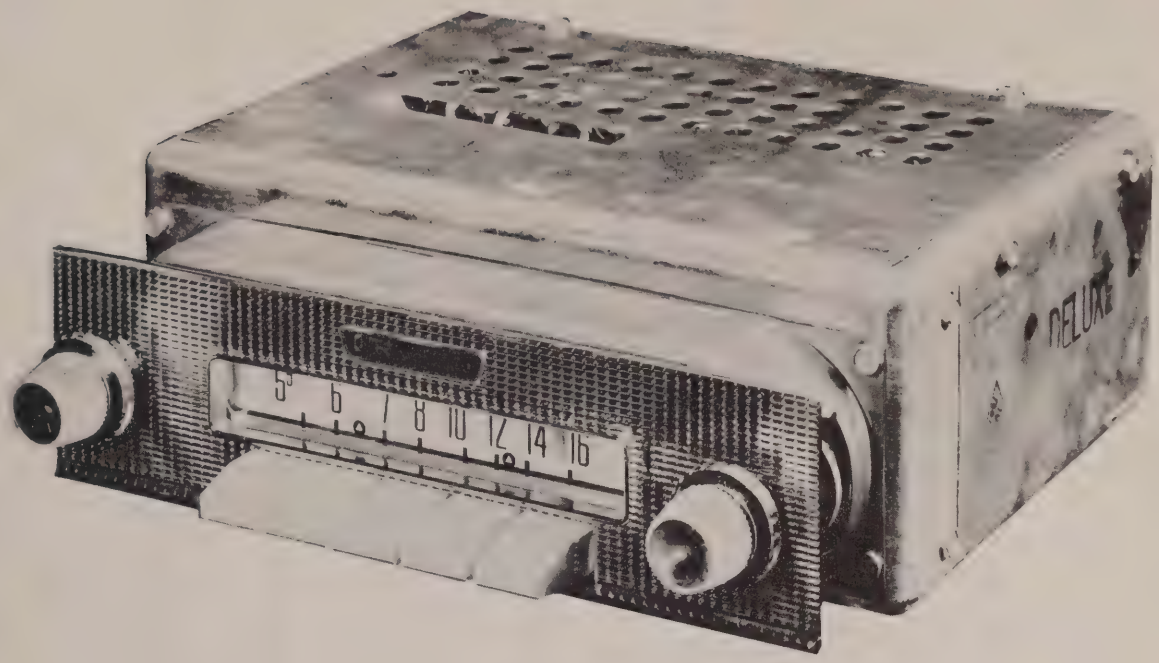
MOTOROLA MODELS 6K13B, CW, M, W (Ch. HS-675)

PHOTOFACT* Folder

EIA ELECTRONIC INDUSTRIES ASSOCIATION MEMBER

RIVERSIDE
MODEL FJB-6679A

RIVERSIDE
MODEL FJB-6679A



RIVERSIDE
MODEL FJB-6679A

TRADE NAME	Magnavox CHASSIS 57-01-00, 57-01-10, 57-01-11, 57-02-00, 57-02-11
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Externally Powered 8 Tube FM-AM Tuner with Stereo Phono Amplifier
TUNING RANGES-BROADCAST	540-1620KC FREQ. MOD. 88-108MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	265KC (Unmod.)	Tuning gang fully open	Across speaker voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	1610KC	"	"	A5	"
3.	68mmf	High side to antenna leads. Low side to chassis.	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and retouch A7 for maximum volume.						

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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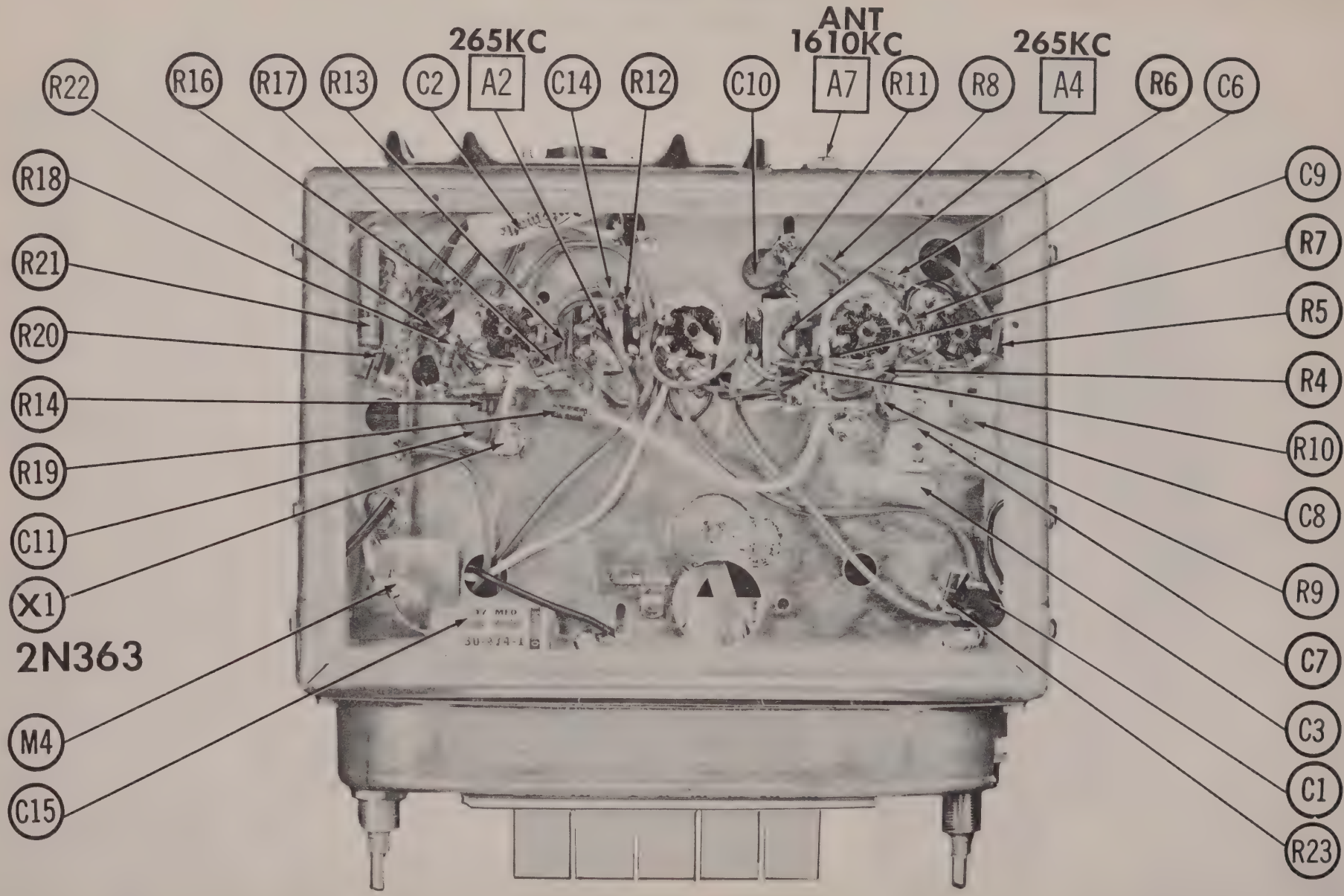


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AF6	12BL6 *
V2	Converter	12AD6	

ITEM No.	USE	TYPE	NOTES
V3	IF Amplifier	12BL6	12AF6 *
V4	Det. - AVC - AF Amp.	12AE6	

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363	Driver			2N363	2N406	PNP
X2	1124	Output	LT-52			2N242	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	RIVERSIDE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	15	20-315	AFH2-02-75	B0045	WP200.7		TVLS-2155 *	
B	▲150	15							
C2	750	3	20-757	SRE3V500	BR1000-6	TC310	TD-1000-6	TVAS-1097 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	RIVERSIDE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.047	200			P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C4				28-800						
C5	40		NPO							
C6	2000				BPD-002	DD-202		B-220	5HK-D2	①
C7A										
B				28-4028						
C	40									
C8	51						L10Q51		5TCC-Q51S *	
C9	27				DI 27	TCZ-27	L10Q27	CNO-427	5GA-Q27	②
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	3000				BPD-003	DD-302	BYA10D3	B-233	5HK-D33	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	27				DI 27	TCZ-27	L10Q27	CNO-427	5GA-Q27	
C15	.47	100		30-474-1	P288N-47		CUB2P47	GEM-2047	2TM-P47	

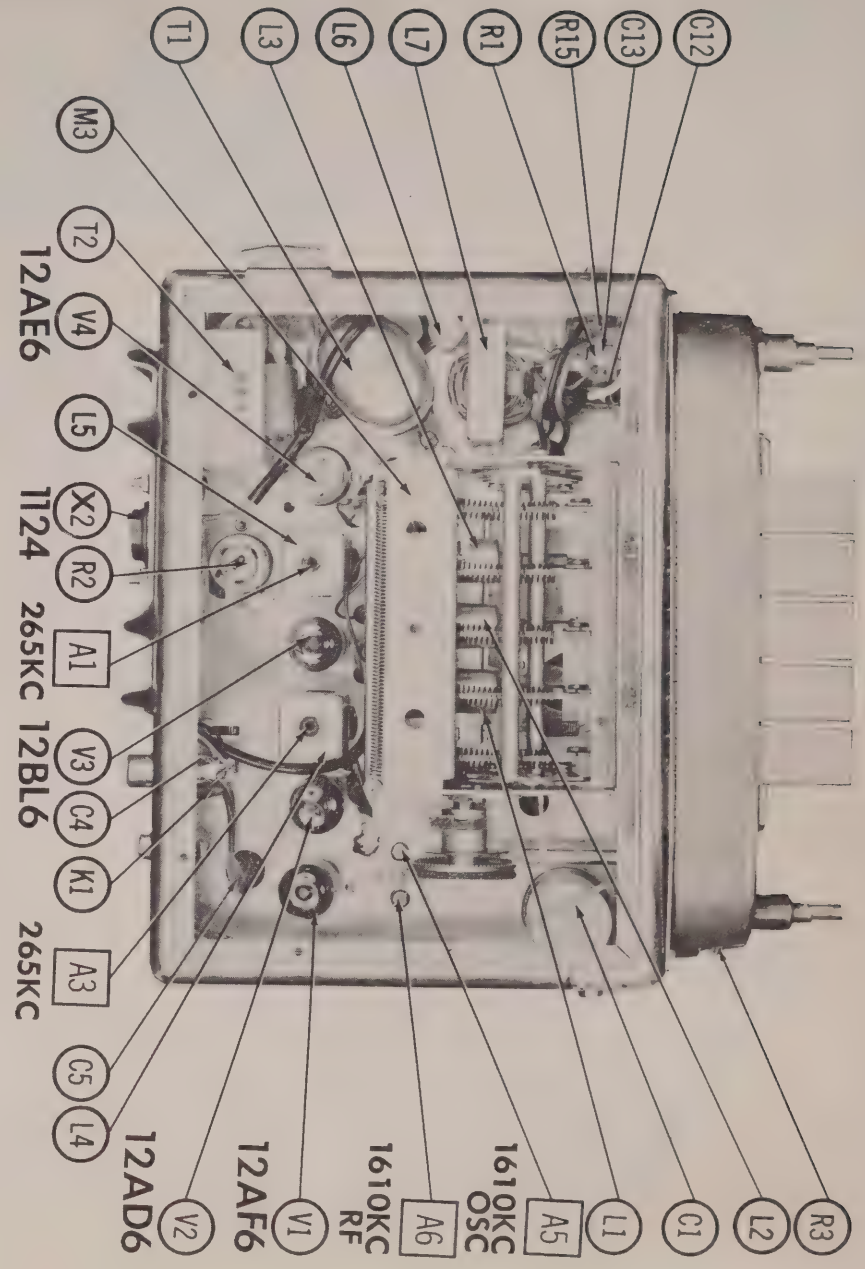
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 3000mmf in this application.
② Some versions may use 12mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RIVERSIDE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	80A618A		RTV-681C	† QJ994A		Tone
B	1meg				Not Req.			Volume, Tap ③ 650K
C	Shaft				Not Req.			
D	Switch				Not Req.			
R2	500Ω	2(WW)	62-501		39-500-100		FL-600S	Bias, Stop ③ 100Ω
R3	25Ω	2(WW)	80A833					Fader

† "Concentrikit" Equivalent: K-2 Kit with base elements and shafts: B13-139, P6-130 (Panel)
B19-137X, R1-212 (Rear)
S5 (Adapter)
76-1 (Switch)
(Not available as a factory assembled unit)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (cont)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RIVERSIDE PART No.	NOTES
R4	1500Ω			
R5	150K			
R6	330Ω			
R7	4.7meg			
R8	2.2meg			
R9	47K			
R10	10meg			
R11	10meg			
R12	47K			
R13	1meg			Note 1

ITEM No.	RATING OHMS	RATING WATT	RIVERSIDE PART No.	NOTES
R14	3.3meg			
R15	100K			
R16	120Ω			
R17	6800Ω			
R18	15K			Note 2
R19	220Ω			
R20	22Ω			
R21	1Ω	2		
R22	470K			
R23	150Ω			

Note 1. Some versions may use 1.2meg in this application.

Note 2. Some versions may use 12K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RIVERSIDE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	†						† Part of M3
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	Input IF	14-265						
L5	Output IF	14-267						
L6	"A" Lead Choke							L 2uh

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	1A	9Ω	.008 Hy.	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	8	1	75A702C						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RIVERSIDE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	130Ω	3-4Ω	75A805 ①							① Alternate Part #75A966

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RIVERSIDE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6" x 9"	PM	3-4Ω	73B902 ①	69A3	
SP2	6" x 9"	PM	3-4Ω	73-655		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RIVERSIDE PART No.	REPLACEMENT DATA
K1	Antenna Input	100mmf, 1.2meg	①	Sprague PRC-9

① Some versions may use individual components in this application.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA RIVERSIDE PART No. FUSE	RIVERSIDE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	AGW	7½A 32V			30707.5 (7AG 7½A 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	RIVERSIDE PART No.	NOTES
M2	Lamp	1891	#1891
M3	Tuner	78-90/490	Pushbutton Type (Specify number on tuner)
M4	Spark Plate	15-801FT	

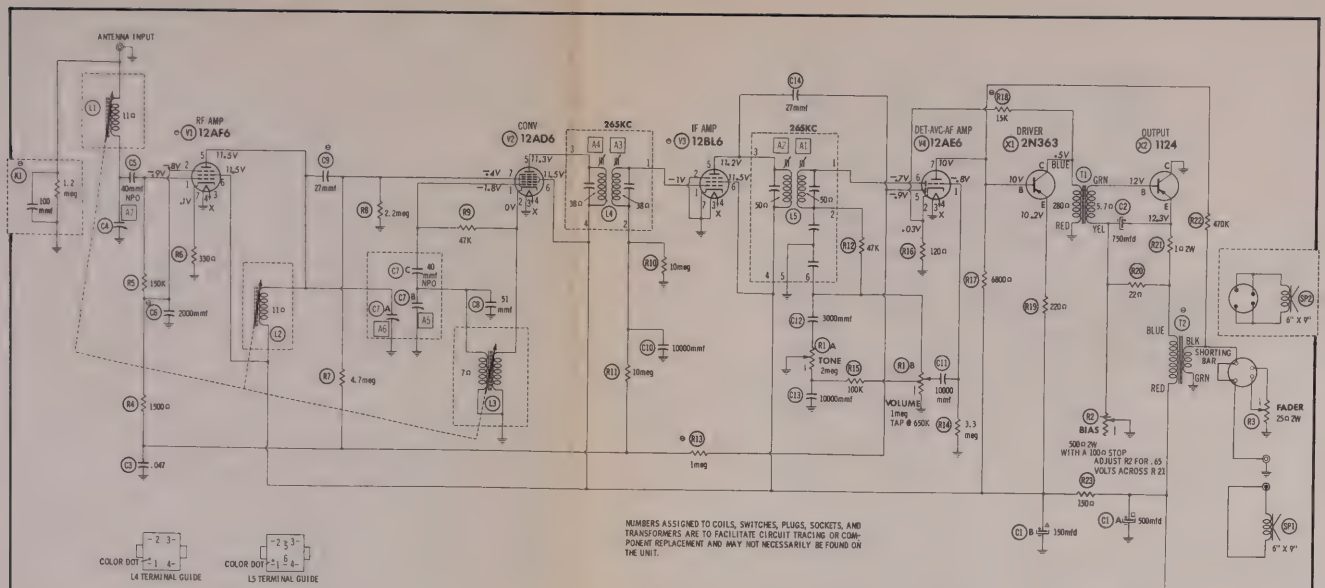
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47-50	Tuning, On-Off-Volume
Knob	48B393	Tone, Fader
Cover	52B323	
Escutcheon	54C827	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AF6	5.5meg	5.4meg	2Ω	0Ω	†160Ω	†150Ω	330Ω
V2	12AD6	47K	7Ω	0Ω	2Ω	†190Ω	†150Ω	2meg
V3	12BL6	7meg	0Ω	0Ω	2Ω	†200Ω	†150Ω	0Ω
V4	12AE6	3.3meg	120Ω	0Ω	2Ω	6.5meg	1meg	†5000Ω

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

† MEASURED FROM JUNCTION OF C1A AND R23.

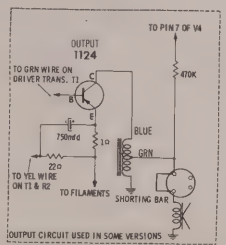
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

BASE
EMITTER
COLLECTOR
BASE
EMITTER
TRANSISTOR (X1) TERMINAL GUIDE
TRANSISTOR (X2) TERMINAL GUIDE



OUTPUT CIRCUIT USED IN SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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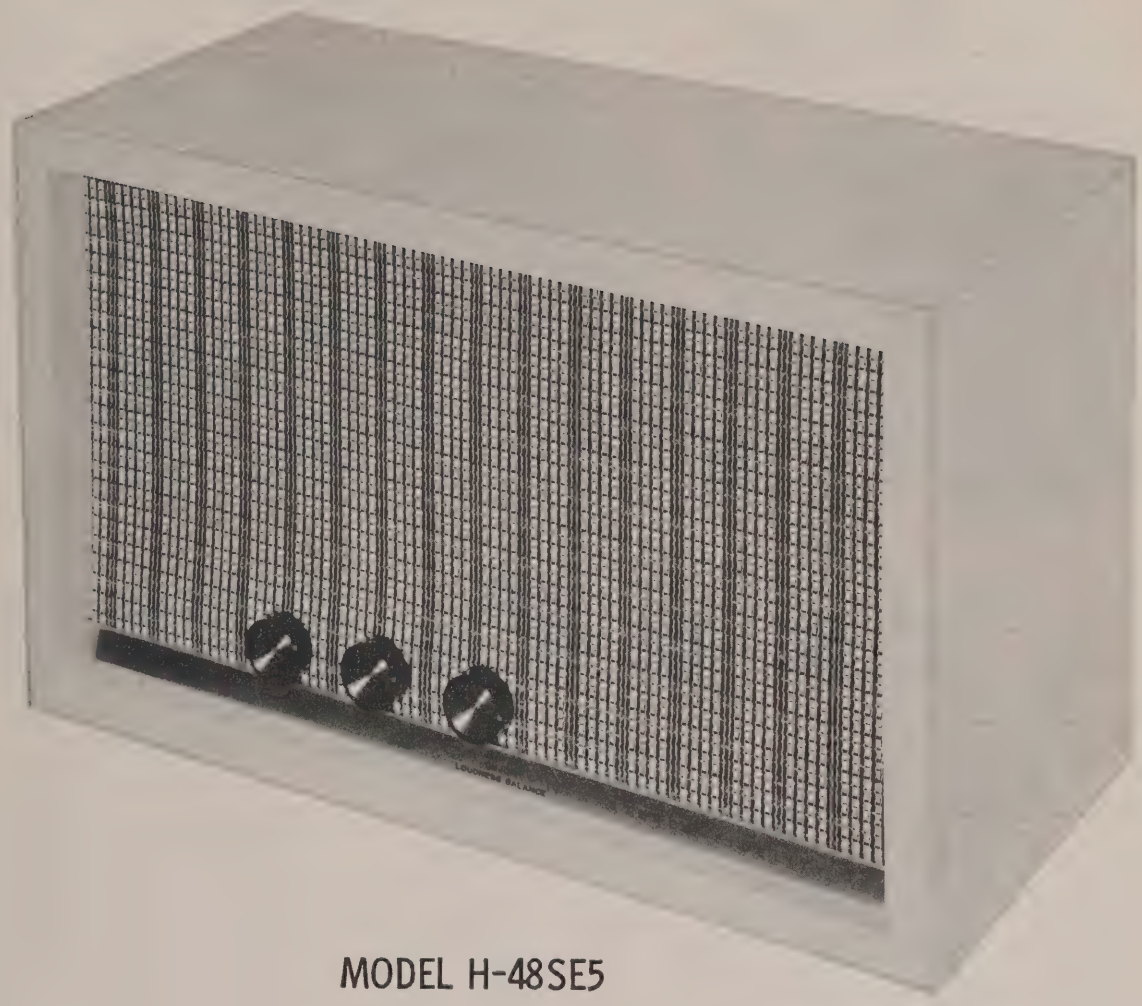
RIVERSIDE
MODEL FJB-6679A

PHOTOFACT* Folder with CIRCUITRACE*

WESTINGHOUSE MODELS H-48SE1, 2, 3, 4, 5 (Ch. V-2503-5)

WESTINGHOUSE MODELS H-48SE1, 2, 3, 4, 5 (Ch. V-2503-5)



MODEL H-48SE5

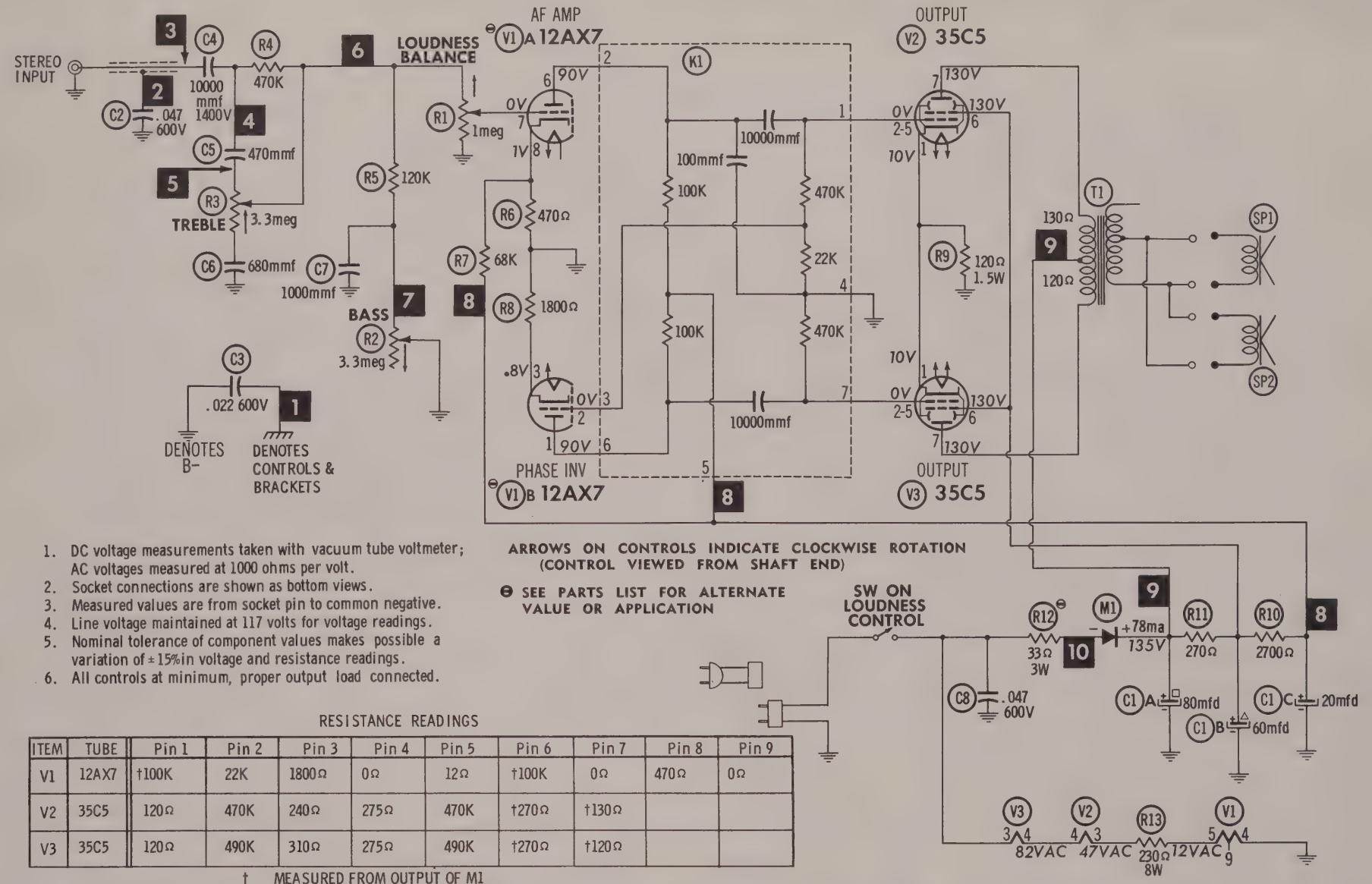
WESTINGHOUSE MODELS H-48SE1, 2, 3, 4, 5 (Ch. V-2503-5)

TRADE NAME	Westinghouse Models H-48SE1, H-48SE2, H-48SE3, H-48SE4, H-48SE5 (CH. V-2503-5)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	105 - 120 Volts AC-DC RATING 33 Watts, .35 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of J85

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†100K	22K	1800Ω	0Ω	12Ω	†100K	0Ω	470Ω	0Ω
V2	35C5	120Ω	470K	240Ω	275Ω	470K	†270Ω	†130Ω		
V3	35C5	120Ω	490K	310Ω	275Ω	490K	†270Ω	†120Ω		

† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*

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DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

WESTINGHOUSE MODELS H-48SE1, 2, 3, 4, 5 (Ch. V-2503-5)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	①
V2	Output	35C5	

ITEM No.	USE	TYPE	NOTES
V3	Output	35C5	

① Alternate 7025.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	218V025H17		BBRT84215	PWP311. 75	TDLT-7	PCLS-3444.8*	
B	60	150							
C	20	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	600		210V214A73	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C3	.022	600		210V062A23	P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C4	10000	1400		215V201A03	DAC-27	DD16-103	HVE16S1	2HV-110	BL-S10	
C5	470			R2CC61Y5471M	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C6	680			215V106A81	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C7	1000			215V101A02	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C8	.047	600		210V024A73	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	270V027H10					Loudness Balance
B	Switch							
R2	3.3meg	½	270V052H03					Bass
R3	3.3meg	½	270V027H09					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R4	470K		RC20AE474K	
R5	120K		RC20AE124K	
R6	470Ω		RC20AE471K	
R7	68K		RC20AE683K	
R8	1800Ω		RC20AE182K	

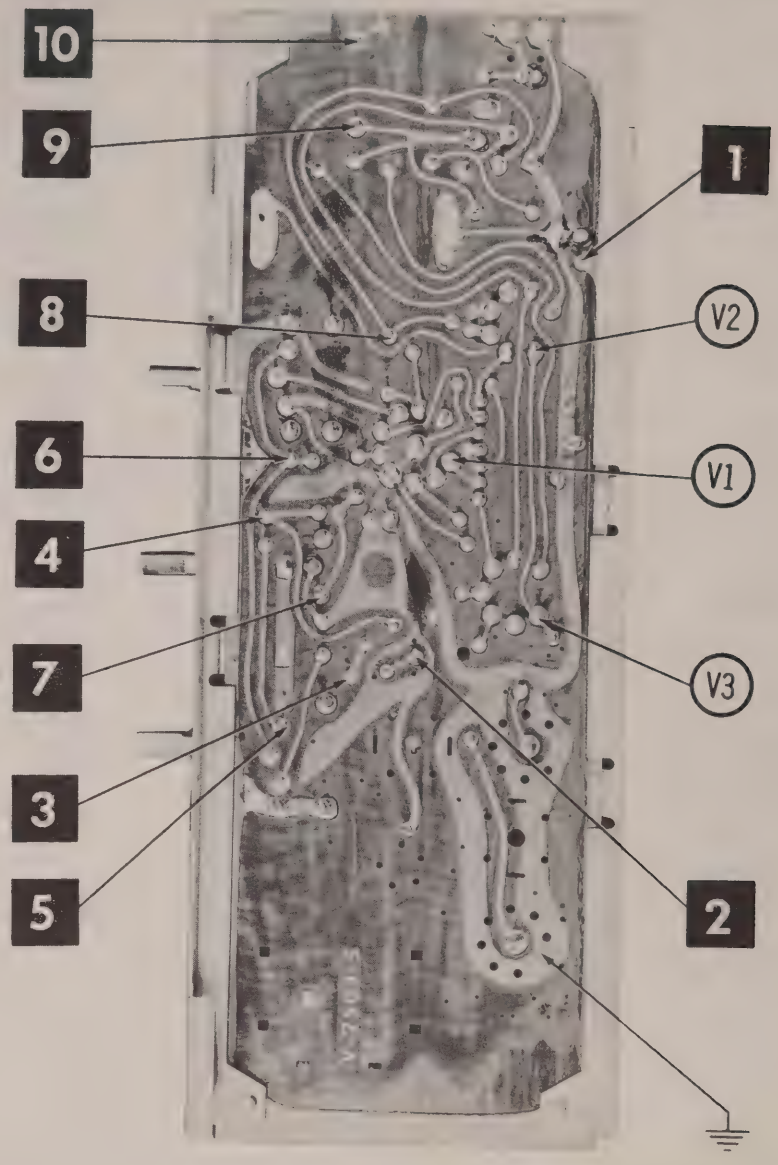
Note 1. Early versions may use 22Ω 3W in this application.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R9	120Ω	1. 5	251V023H19	
R10	2700Ω		RC20AE272K	
R11	270Ω		RC20AE271K	
R12	33Ω	3	251V023H22	Note 1
R13	230Ω	8	251V020H17	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Coupling Net	100mmf, 10000mmf, 10000mmf, 22K, 100K, 100K, 470K, 470K	219V024H02	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4100Ω CT	16Ω Tap ⓐ 8Ω	430V074H01	Z1002	A-2901	AU-600	A-3823	24S61	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	6"	PM	12-14Ω	570V057H01①	6A21Z12. 2①	① Parallel And Phase
SP2	6'	PM	12-14Ω	570V057H01①	6A21Z12. 2①	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Westinghouse PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.078A	295V012H03 ①	1235AH① HA154 ②	T100 ① SD-94 ②	100AV ① K200 ②	① Selenium Type ② Silicon Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

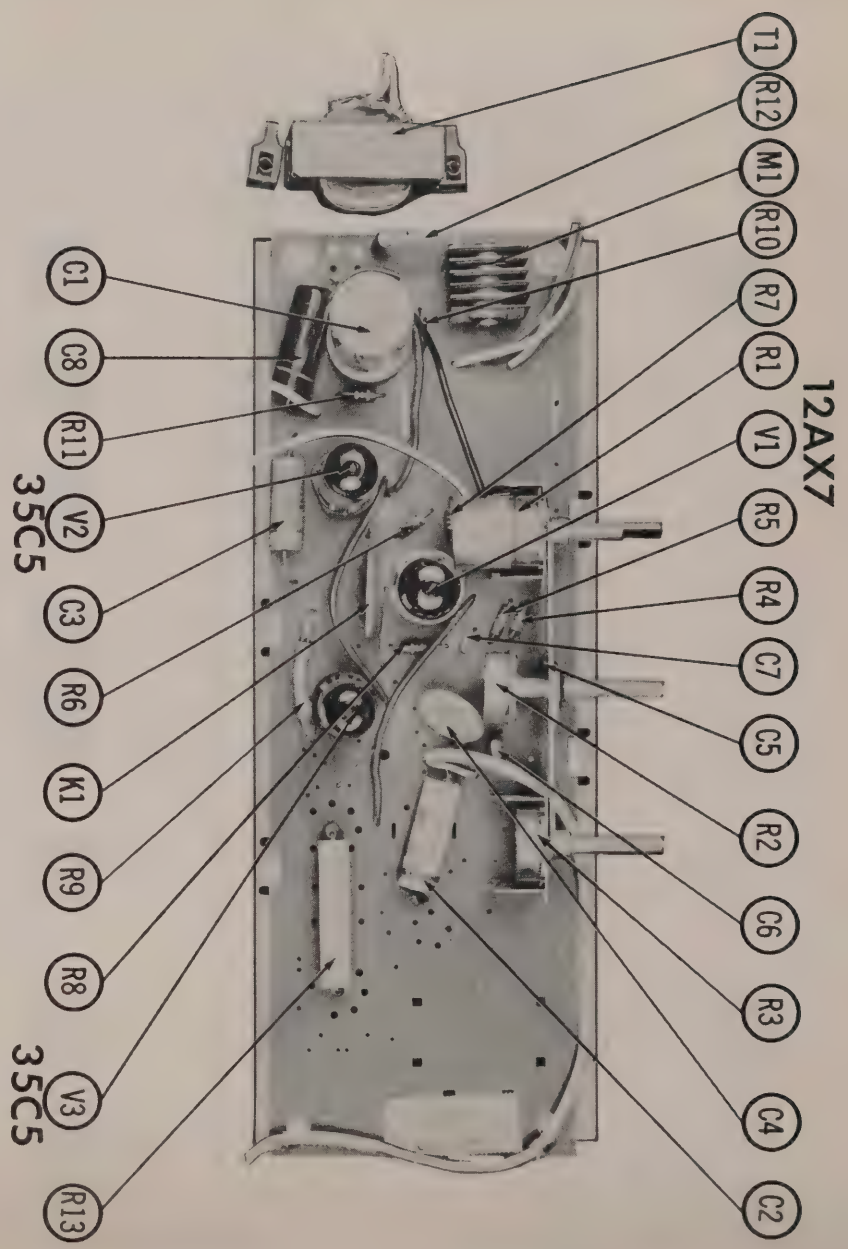
NAME	PART NO.	DESCRIPTION	
Knob	550V092H05	3 Used	
Cabinet	516V076H05	Tutone	Model H-48SE5
Cabinet	516V076H01	Mahogany	Model H-48SE1
Cabinet	516V076H02	Oak	Model H-48SE2
Cabinet	516V076H03	Fruitwood	Model H-48SE3
Cabinet	516V076H04	Walnut	Model H-48SE4

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



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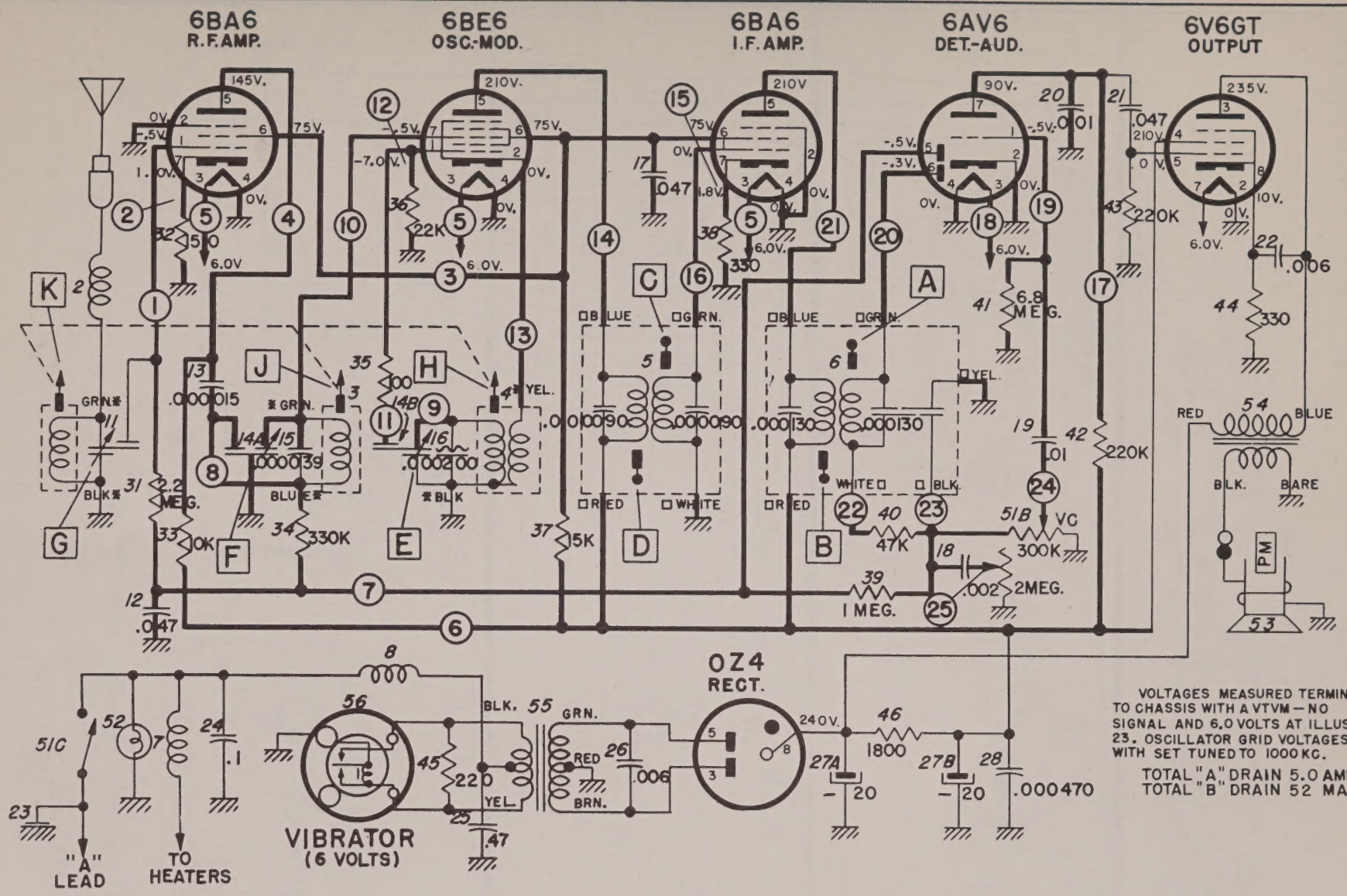
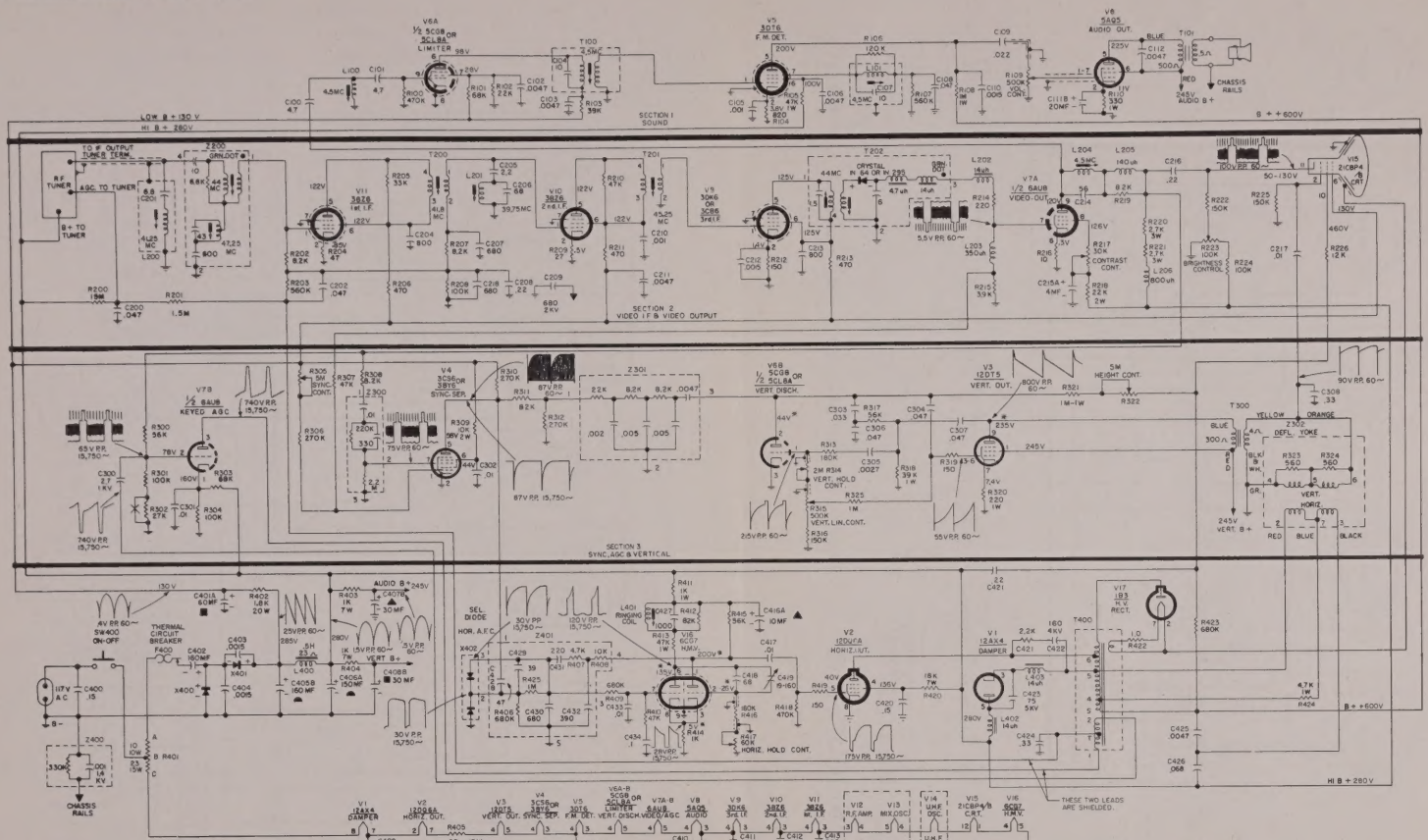
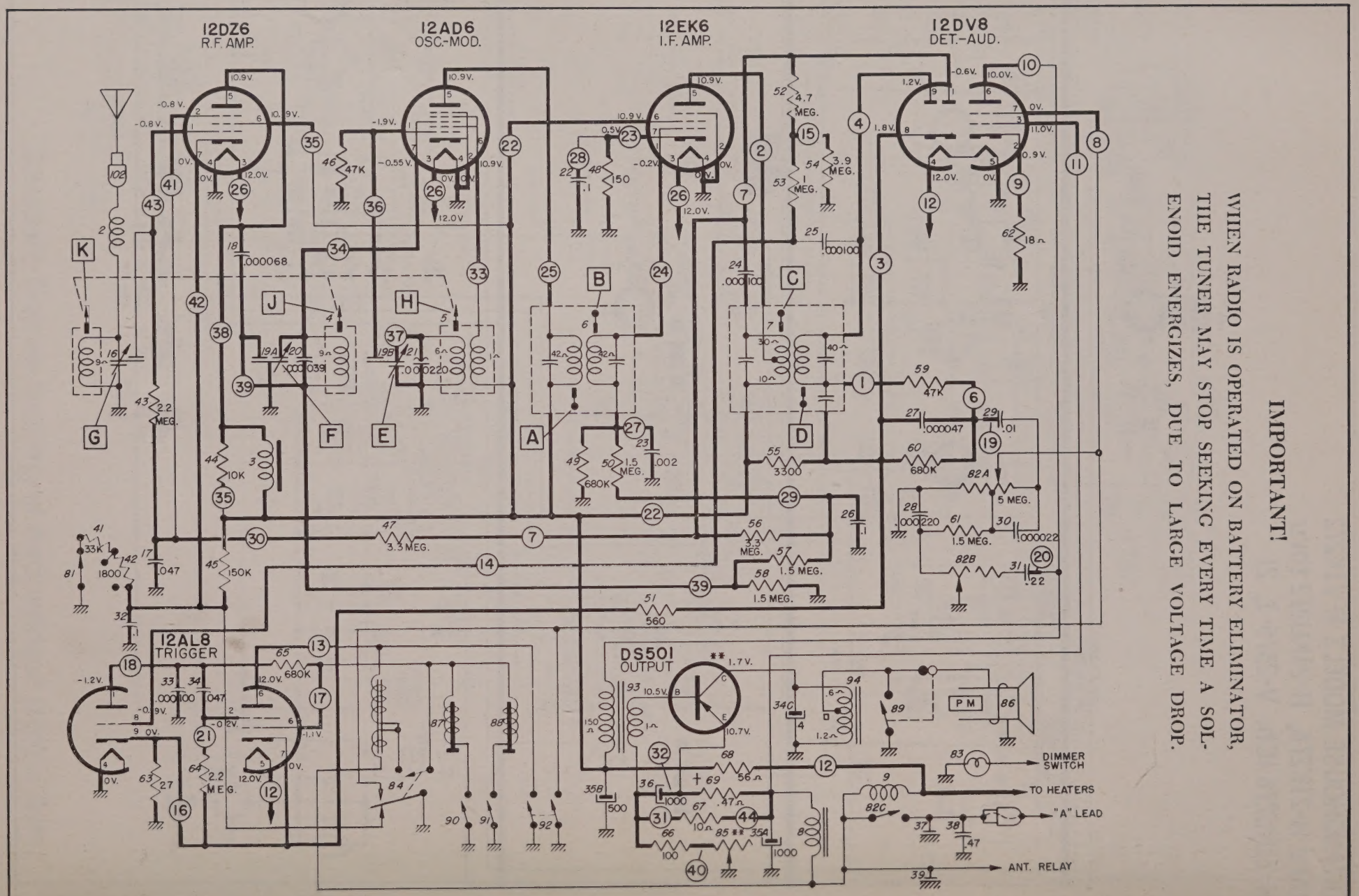


OPEL REKORD MODEL 981946 Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.

WESTINGHOUSE MODELS H-21K272 thru H-21K276, H-21KU272 thru H-21KU276 (Ch. V-2375-1, 2)



Schematic Diagram Courtesy of Westinghouse Electric Corp.



IMPORTANT!

WHEN RADIO IS OPERATED ON BATTERY ELIMINATOR, THE TUNER MAY STOP SEEKING EVERY TIME A SOLENOID ENERGIZES, DUE TO LARGE VOLTAGE DROP.

PONTIAC MODEL 988977

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.